

SORENSEN
POWER SUPPLIES

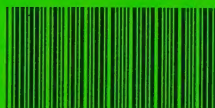
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Instruction Manual

Storage

SRX 5-200 SWITCHING POWER SUPPLY

MP MASTER



MA25466

Sorensen Company

676 Island Pond Road
Manchester, N.H. 03103

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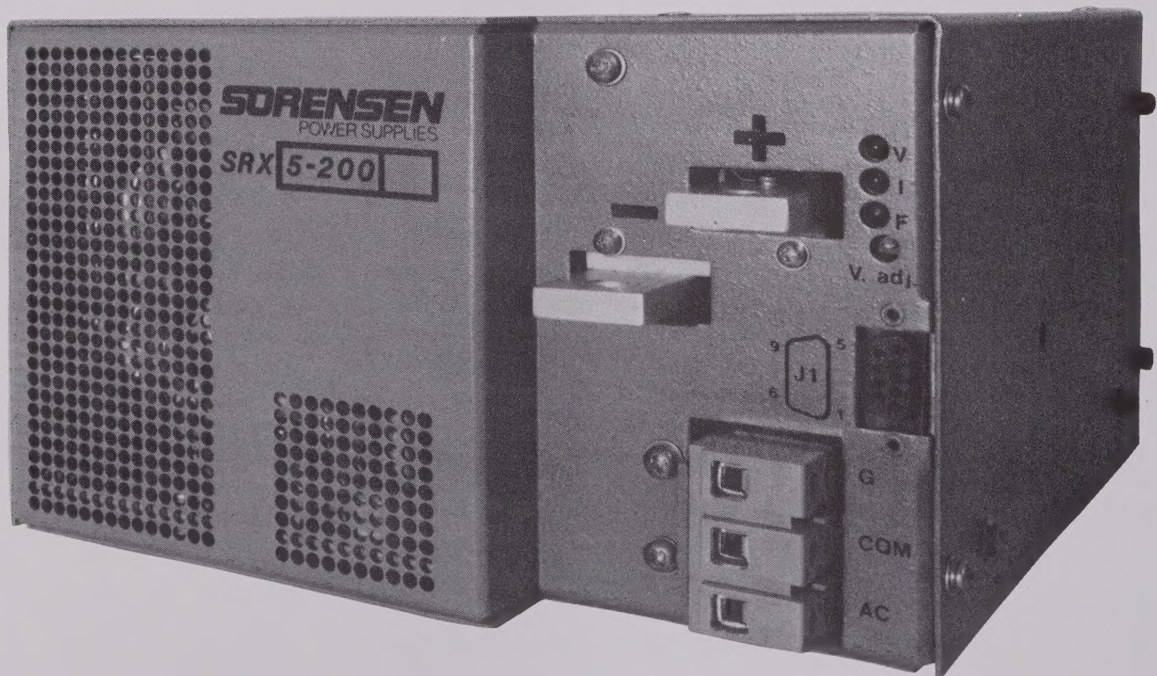
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RAYTHEON

SORENSEN
POWER SUPPLIES

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INSTRUCTION
MANUAL
FOR
SRX 5-200
SWITCHING
POWER SUPPLY



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SECTION 1

INTRODUCTION

1.1 PURPOSE

This manual contains operation and maintenance instructions for the SRX 5-200 switching power supply. The purpose of this manual is to provide sufficient operating and maintenance instructions to ensure a long operating life.

1.2 DESCRIPTION

Sorensen SRX 5-200 units are built and tested to meet the power requirements for computers, memories, and large digital designs. Housed in an industry standard package, the SRX offers 1/3 more output power than comparable units. The high power density and high efficiency (75%) coupled with a flexible mounting arrangement, makes the SRX unit ideal for use in any electronic product requiring high density packaging.

The SRX incorporates advanced switching technology, conservative design approach, and modular packaging to achieve high performance and reliability at a low unit watts cost.

In order to maintain the specifications and to ensure the long life designed into these power supplies, it is important that all instructions be followed.

1.3 FUNCTIONAL DESCRIPTION

Operational features of the SRX 5-200 power supply include remote sensing (regulation), overload and short circuit protection by automatic current limiting, and overvoltage and undervoltage protection through an integral electronic shutdown circuit.

1.3.1 Remote Sensing

For applications where variation in the load-lead voltage drop may adversely affect load regulation, remote sensing may be used to establish the regulating point at the load rather than at the output terminals.

1.3.2 Series and Parallel Operation

The SRX 5-200 may be operated in direct series connection in any desired number. (See para 1.4.23 for output isolation limits).

Direct parallel connection may also be made. In parallel operation, however, the units will not automatically share the load. In order to operate in parallel, determine the load to be carried by the first unit (200A maximum) and set the current limit accordingly. The remainder of the load will be supplied by the second unit, etc.

1.3.3 Overcurrent Protection

In the event of an excessive current condition such as a short circuit, a current limit circuit acts to limit the unit output current. This is adjustable from 0 to 110% of rated load. The output folds back to approximately 70% under short circuit.

1.3.4 Overvoltage Protection

In the event of an overvoltage condition on the output, such as produced by an open sense lead, an overvoltage sensing circuit is actuated. This OVP acts to quickly reduce the output voltage to zero by shutting down the power inverter.

The OVP trip point is factory set within a range of 5.6 to 6.0 Vdc. The OVP is reset by interruption of the ac power.

1.3.5 Remote Control

The SRX 5-200 dc output may be controlled with an external shorting switch from pin 9 of the "D" connector to pin 4, or by a TTL LOW signal at the same points.

1.4 ELECTRICAL SPECIFICATIONS

1.4.1 Input Voltage

208/220/230 Vac (190-250 Vac), Single phase, 47-63 Hz standard. 115 Vac (95-127 Vac) (Optional). Add M1 to model number.

1.4.2 Output Voltage

5.0 Vdc nominal. Adjustable range: 4.75 to 5.5 Vdc.

1.4.3 Output Current

0 to 200A.

1.4.4 Regulation

0.1% maximum combined line and load variations within specified range.

1.4.5 Ripple and Noise

15 mV maximum rms ripple. 50 mV typical, 100 mV maximum peak-to-peak ripple.

1.4.6 Efficiency

75% typical.

1.4.7 Temperature Coefficient

.015%/°C.

1.4.8 Long Term Stability

±1%, after 1/2 hour warm-up.

1.4.9 Hold-up Time

40 ms at nominal line and load.

1.4.10 Transient Response

200 μ s maximum recovery to regulation bandwidth after a 50% step load change within 10-100% of full load. Maximum excursion $\pm 4\%$ (rate of step load, 2.5A per μ s).

1.4.11 Overshoot

Less than 1% overshoot on turn-on, turn-off, or inhibit.

1.4.12 Remote Sensing

Capable of maintaining regulation at the load, compensating for load lead voltage drop of up to 0.25V. The voltage at the output terminals must not exceed its maximum rating.

1.4.13 AC Failure Flag

Logic LOW level flags ac power failure (14 ms typical delay response). Flag sinks a maximum of 8 mA and sources a minimum of 0.2 mA.

1.4.14 On/Off Control

Logic LOW to inhibit.

1.4.15 Margin Check

Open collector logic LOW (0-.4V) on HI margin to raise output 5% or on LO margin to lower output 5%.

1.4.16 External Crowbar Drive

100 mA maximum drive for external SCR crowbar. External limiting resistor required.

1.4.17 Overload Protection

Automatic Current Limiting adjustable from 0 to 110% of rated load. Foldback to approximately 70% under short circuit.

1.4.18 Overvoltage Protection

Fixed OVP trip point within range of 5.6 to 6.0 Vdc. Reset by interruption of ac input power.

1.4.19 Overtemperature Protection

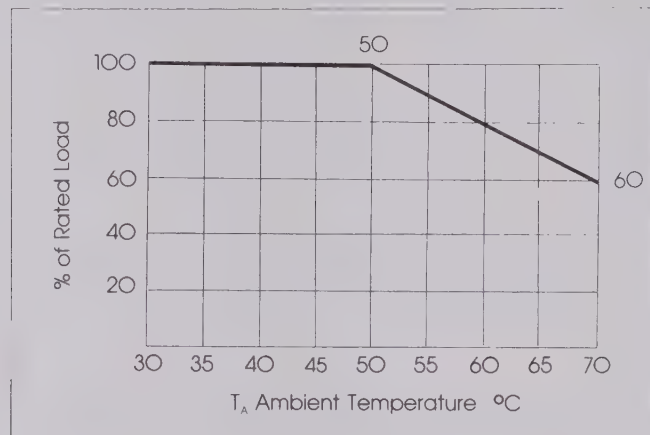
Automatic shutdown under overtemperature conditions. Reset is automatic upon cooling.

1.4.20 Low Line Protection

Automatic shutdown under continuous low input voltage. Reset is automatic when normal ac voltage returns.

1.4.21 Operating Temperature

Full load rating from 0° to 50°C, derate to 60% at 70°C. (See power derating curve).



Power Derating Curve

1.4.22 Storage Temperature

-55°C to 85°C.

1.4.23 Isolation

2.1 kV dc test input to output and input to case. 500 Vdc between output and case.

1.4.24 EMI Suppression

Filters are incorporated for the suppression of conducted EMI.

1.4.25 Power Density

2.47 watts per cubic inch.

1.4.26 Cooling

Fan cooled.

1.5 MECHANICAL SPECIFICATIONS

1.5.1 Outline Dimensions

Industry standard case size: (See Outline Drawing, Figure 1-1). 127 mm H X 230 mm W X 279 mm L (5" H X 8" W X 11" L).

1.5.2 Mounting Dimensions

Top and Bottom: 146 mm X 171.5 mm (5.75" X 6.75").

Side: 101.6 mm X 171.5 mm (4.00" X 6.75").

8-32 mounting screws, maximum engagement: 9.5 mm (.375).

1.5.3 Weight

6.8 kg (15 lb).

1.5.4 Air Flow

Standard Model: Intake from the connector end and discharge at the opposite end. Reverse air flow is an optional feature, (consult factory).

1.5.5 Input Connector

Enclosed terminal strip (Weidmuller MK 6/3 4185.2), # 10 AWG maximum.

1.5.6 Control Connector

9 pin receptacle connector (AMP 207084-1).

Pin Assignment:

1. AC Flag (return to - Sense).
2. + Out
3. - Out
4. - Sense
5. + Sense
6. LO Margin (return to - Sense)
7. HI Margin (return to - Sense)
8. External crowbar drive
9. Remote ON/OFF control (return to - Sense)

NOTE 1. Terminals 4 and 5 must be properly connected. (See Installation, section 2, para 2.5).

1.5.7 DC Power Out

Bus Bar connection (accepts up to 5/16" Dia. bolt).

1.5.8 Finish

Blue epoxy paint.

SECTION 2

INSTALLATION

2.1 GENERAL

After unpacking, general inspection and preliminary check-out procedures should be performed to assure that the unit is in proper working order. If it is determined that the unit has been damaged, the carrier should be notified immediately. Repair problems may be directed to the nearest Sorensen Representative, or to the Service Department, Sorensen Company, 676 Island Pond Road, Manchester, New Hampshire, 03103.

2.2 INSPECTION

Check for damage incurred during shipment as follows:

1. Inspect enclosures for dents, chips, and other obvious signs of damage.
2. Check condition of all external connectors.
3. If internal damage is suspected:
 - a. Remove the case cover.
 - b. Inspect the components and printed circuit boards for damage.
 - c. Inspect the fan.
 - d. Check that the circuit boards and power transformers are firmly plugged into their sockets. These are readily removable for servicing.

2.3 INPUT CONNECTIONS

The SRX 5-200 is normally supplied wired for 208/220/230 Vac (190-250), single phase, 47-63 Hz.

Input connections are made through a front panel mounted connector (Weidmuller K6/3 4185.2) with a #10 AWG maximum wire size. Check cover markings for correct input wiring. (See Figure 1-1).

120 Vac (95-127) input is available as an option. Specify model M1. This conversion can be made in the field by changing the fan, fuse, and internal links. Contact the factory if this change is contemplated.

2.4 INPUT FUSING

The SRX 5-200 input line is fuse protected. In the event a fuse blows, disconnect the unit from the input line and examine the unit for internal shorts before replacing the fuse. The fuse is located internally behind the control connector. To replace the fuse, remove the cover by removing 11 flat head screws on the left side and top, and 6 pan head screws on the right side of the cover.

The standard 220 Vac unit is protected by a 15A, 250V fuse while the M1 option uses a 25A, 125V fuse.

2.5 OUTPUT CONNECTIONS

Connect the load to the plus and minus output terminals which are shown in Figure 1-1. These are copper straps 0.25 inches thick by 0.875 inches wide (6.4 mm X 22 mm), which accept a screw of 5/16 inches (7.9 mm) in diameter, maximum.

Other output functions are contained in a 9 pin receptacle connector (AMP 207084-1). For pin assignments on this connector see the information in Section 1 para 1.5.6.

Pins 4 and 5 in this connector must be joined to the 5V output in either of two ways:

1. Local Sense: Link 2-5 and 3-4 with short jumper wires (#22 AWG) inserted in mating 9 pin connector. (Mating connector and pins are supplied).
2. Remote Sense: Connect a twisted pair cable (#22 AWG, 2 colors) to pins 4 and 5 in the mating connector. Connect the remote end of the cable to the remote sense point, terminal 4 wire to (-) Output, and terminal 5 to (+) Output lead.

2.6 AIR FLOW

Install the unit so that both fan intake and exhaust areas are unrestricted, to allow normal air flow. The mechanical specification section defines normal air flow direction. Reversed air flow is also available as an option (consult factory).

SECTION 3

OPERATION

3.1 GENERAL

This section contains instructions on how to operate the unit.

NOTE

The sensing and power circuits form a closed loop. Opening this loop, either by removing a link or disconnecting a sensing lead, will result in a high unit output and will cause the OVP circuit to operate.

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Input connections are made through a front panel mounted connector (Weidmuller MK6/3 4185.2) with a #10 AWG maximum wire size. Check cover markings for correct wiring. (See Figure 1-1).

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The standard 220 Vac unit is protected by a 15A, 250V fuse while the M1 option uses a 25A, 125V fuse.

3.4 OUTPUT CONNECTIONS

Connect the load to the plus and minus output terminals which are shown in Figure 1-1. These are copper straps .25 inches thick by .875 inches wide (6.4 mm X 22 mm), which accept a screw of 5/16 inches (7.9 mm) maximum.

The other output functions are contained in a 9 pin receptacle connector (AMP 207084-1). For pin assignments on this connector see paragraph 1.5.6 in Section 1.

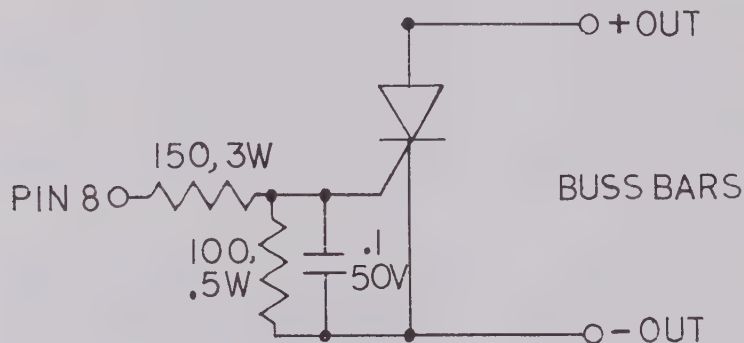
3.5 CONTROLS

The SRX 5-200 is equipped with two controls; output voltage, variable from 4.75 to 5.5 Vdc, and the current control, variable from 0 to 220A. The output voltage control is accessible through a hole in the front panel just over the "D" connector, and the current control is accessible through a hole in the right side of the unit. (See Figure 1-1 for location of these controls). Both are factory set for nominal value; 5.00 Vdc at 200A.

The Lo margin check is available at pin 6 and is also returned to the - Sense at pin 4. This circuit requires an open collector low level TTL or a shorted switch.

3.6 EXTERNAL CROWBAR DRIVE

The external crowbar drive is available at pin 8 of the "D" connector and is returned to - Out. The circuit requires an external limiting resistor for the customer supplied SCR circuit. This will supply a maximum of 100 mA for the SCR application. See the accompanying schematic for a typical application



3.7 MODE INDICATORS

The LED indicators, located on the front panel above the voltage adjust potentiometer, (see Figure 1-1) indicate proper operation, current limit mode, and fault mode. The "V" LED indicates proper operation in the voltage mode while the "I" LED, when lit, indicates that the unit has exceeded preset current limits and is in the current mode. The "F" LED indicates that there is no output from the unit which could be caused by several possible malfunctions such as; low line, control shutdown, or thermal shutdown.

SECTION 4

THEORY OF OPERATION

4.1 GENERAL (Refer to Block Diagram, Figure 4-1)

The SRX 5-200 circuitry incorporates switching techniques which contribute to the high efficiency and exceptional power density (high power output capability and small physical size) of the unit.

The basic circuit consists of a full bridge pulse width modulated inverter operating from the rectified ac input line. The output is rectified and filtered to provide the 5 Vdc at 200A output. The dc output is sensed and compared with a reference voltage. Any difference, or error voltage, is amplified and used to control the pulse width of the inverters. This achieves a closed loop which results in excellent line/load regulation.

4.2 CIRCUIT DESCRIPTION

4.2.1 Input Circuits (Refer to Main PCB schematic diagram, Figure 6-4)

Input power is applied through RFI chokes L1-A and L1-B. It is then fullwave rectified in bridge CR9 and filtered by capacitors C7 through C13. The output of this section is +300 Vdc which establishes the operating level of the main inverter transistors on A3 and A4 inverter boards.

Inverter power is also applied to the primary of T1 for bias power. The output of this transformer is rectified, filtered and applied to the 15 volt IC regulator. This supplies a regulated +15 Vdc for operation of the various integrated circuits in the SRX 5-200.

4.2.2 Inverter Boards A3 and A4 (See Figure 6-8)

A3 and A4 are identical circuits. Each consists of a half wave inverter operating at 20 kHz. The VA and VB pulse drive outputs of the A2 control board are applied as the input for each board through J1-1.

The input pulse is applied to the base of Q1, turns it ON, and applies power to windings 2 and 3 of T1. This pulse is transformer coupled to turn on Q3 and Q4. At the end of the input pulse, Q1 is turned off. To ensure turn off for Q3 and Q4, Q2 is forced on when Q1 is off. Q2 provides reverse current for Q3 and Q4 via transformer action to turn them off completely.

A3 and A4, however, are pulsing on alternate cycles. The A3 and A4 inverters are then combined to provide a full wave bridge input to A5-T1. Capacitors A1-C18 and A1-C19 block any dc current from A5-T1 to prevent dc core saturation. Core saturation due to unequal pulse currents from A3 and A4 could cause the switching transistors to fail.

4.2.3 Output PCB (See Figure 6-13)

The full wave outputs of A3 and A4 are applied to the primary of A5-T1 and are full wave rectified through CR1-CR8 to develop the 5 volt (nominal) output at

200A. This is further filtered by the output filter assembly L4, L5 and C28 through C33. (See Figure 6-1).

4.2.4 J1 Output Connector (See Section 1, Para 1.5.6 for pin assignment)

This connector enables the user to interface with the various control functions. Pins are provided for the output sense leads to permit selection of either local or remote sense, the HI and LO margin control signals, and the inhibit shut-down control signals. It also provides a pulse drive for the user who desires to utilize an external SCR crowbar whenever the OVP trips, and an ac flag warning output logic signal.

4.2.5 Control Circuits (Refer to Figure 6-6)

The A2 control board is the heart of the SRX 5-200, combining basic control functions with many auxiliary functions. The control circuit generates a fixed frequency pulse train which provides base drive for the four power inverting transistors. The pulse width is varied in response to an error voltage detector so that the dc output voltage is closely regulated. The error voltage is obtained by comparing the dc output voltage to an internal reference voltage and amplifying the difference.

In order to present the functions of each chip in an orderly and coherent manner, each will be examined separately and the purpose of each explained.

A. A2-U1

U1 is the pulse width modulator which includes an accurate (1%) 5.1V reference at Pin 16. Capacitor C7 (at Pin 5) and resistor R9 (at Pin 6) set up the basic operating frequency of 40 kHz $\pm$ 10%. The error amplifier has its input on Pin 1 and the reference voltage is applied to Pin 2. The internal error amplifier uses these signals to control the internal pulse width modulator. Trimmer R36 controls the output voltage level by varying the voltage applied to Pin 1.

VA (Pin 11) and VB (Pin 14) are each half frequency output control pulses (20 kHz) to drive the A3 and A4 inverter boards for alternate firing. R10 sets up the discharge circuit (Pin 7) to determine the gap time between pulses to prevent overlapping. Overlapping pulses would cause failure of the power inverter transistors.

A soft-start circuit is provided (Pin 8) which, in conjunction with C4, gradually widens the pulse width so the power transistors are gently started up. Fast turn on of these transistors could cause damage. The start up time of the soft start circuit is approximately 100 ms. The soft start circuit is utilized to restart the output gently after any fault condition or inhibit signal has caused output shutdown.

HI and LO margin controls are also tied in to the reference chain of U1 (Pins 1 and 2). A2-R26 is the LO margin control which is tied in to the reference circuit of error amplifier U1. This LO margin circuit requires an open collector TTL for control. When the TTL Logic is LOW, it will lower the reference voltage by 5%, thereby reducing the output by 5%. Resistor A2-R25 is the HI margin control and is tied to

the feedback resistance divider of U1. Using the same approach as the LO margin circuit, a TTL LOW will increase the sensing voltage by 5% thus raising the output by 5%. The margin control signals (supplied by the user) are applied to front panel connector J1-6 (LO) and J1-7 (HI).

B. U3 provides the various auxiliary functions such as current limit, OVP, inhibit, thermal shutdown, and ac flag. Each of these functions will be examined separately. U3 also generates a precision reference voltage.

- a. Reference Voltage: Pin 15 supplies a $2.5V \pm 1\%$ reference voltage. This is used internally on U3 for the OVP reference and for the undervoltage detector. It is used externally for the current-limiter.
- b. Overvoltage Protection: A sample of the + output voltage is applied to Pin 6. This voltage is compared to the internal 2.5V reference. The error is amplified to produce a logic HIGH on Pin 5, whenever an overvoltage occurs. C10, however, acts to delay the rise of the voltage on Pin 5 for a period of 50 μs . This delay will eliminate nuisance tripping of the OVP. When Pin 5 goes HIGH, CR3 will latch the input to hold Pin 5 HIGH until reset.

Pin 5 High is inverted to a LOW which appears on Pin 4. This LOW is connected to U1-8 (soft-start) to shut down the U1 pulse generator (until reset). The output drops to zero.

R28 on U3 (Pin 6) is the OVP adjust and may be changed to adjust the OVP level. The OVP is normally factory set to trip at 5.7 to 6.0 Vdc. The OVP section of U3 also generates an output suitable for driving an external SCR crowbar at U3-1. This connection may be made at J1, Pin 8, on the front panel.

- c. Current Limiter: The current level in the main power transformer (A5-T1) is measured by the primary of the current transformer (A1-T2). The ac signal on the secondary of T2 is rectified and applied to U3-11. It is compared to a reference voltage (U3-10). When the preset level is exceeded, the amplified error signal appears on U3-13. It is applied to U1-9 (through CR1) to lower the U1-9 voltage. This reduces the pulse width so that the output current is lowered to a safe level.

The current limit level is set by trimmer R14. Note that R16 samples the output voltage so that the current limiting setting is reduced (foldback) when severe overloading (or short circuit) occurs.

- d. Undervoltage Detector: This function is to detect the loss of ac input voltage (or abnormally low ac voltage). The user is given advance warning of the impending loss of dc output voltage.

U3-7 receives a rectified dc voltage sample, which is proportional to the ac input voltage. This voltage is compared to the internal 2.5V reference. If the ac voltage falls below the preset level, the

amplifier output (U3-8) is driven HIGH. C11 acts to delay the rise of voltage on Pin 8 for approximately 15 ms. This delay serves to eliminate nuisance warnings caused by momentary loss of line voltage.

After the 15 ms time has elapsed, U3-8 generates a HIGH. This is inverted to appear as a LOW at U3-9. This U3-9 LOW signals the user through panel connector J1-1.

Note that the FLAG signal appears at least 10 ms before the 5V output has fallen below 4.9V. This warning enables an orderly shutdown of the user's computer memories. The ac flag output is available on Pin 1 of J1 on the front panel.

- e. Inhibit: Pin 9 on J1 is used to shut down the 5V output under command of logic LOW signal which is connected to U3, Pin 2. It generates a logic LOW at U3-4 which is connected to the soft-start circuit of U1-8. The output will then drop to zero as the pulse generator (U1) is shut down.
- f. Thermal Shutdown: Thermal switch (S1), located on the main PCB assembly, is tied to the inhibit circuit and will shut down the power supply in the event of overheating.

C. A2-U2

U2 comparator is used to provide four functions:

- 1. Bias low-level detector.
- 2. Current limiter indicator LED (DS2) drive.
- 3. Fault Indicator LED (DS3) drive.
- 4. Voltage Mode Indicator LED (DS1) drive.

Each function is described in detail as follows:

- 1. Bias Detector: This section monitors the +15V bias supply. It acts to shut down the output whenever the +15V falls below a preset level. This detector prevents false firing which could damage the power transistors.

U2-5 samples the +15V levels and compares it to a 5.1V reference voltage at U2-4. If this level is low, the comparator output is driven LOW. This LOW acts to inhibit the output (through soft-start U1-8).

- 2. Current Limiter Indicator: This section monitors the state of the current limiter. U2-8 and U2-9 detect whenever CR1 is conducting (which means the output is in limiting mode). The comparator output (U2-14) turns DS2 on.

3. Fault Indicator: This section detects any shut down of the output caused by OVP trip, thermal overheat, inhibit, or bias undervoltage. U2-11 monitors U1-8. A LOW on U1-8 causes the comparator output U2-13 to turn on DS1. (U2-10 receives a 2.5V input reference from U3-15).
4. Voltage Mode Indicator: This section indicates that the output voltage is normal. U2-6 detects the absence of both Current Limit (DS2 must be off) and the absence of Fault (DS1 must be off). If both are off, DS3 will turn on. The comparator output (Pin 1) turns DS3 on. (U2-7 receives a 5.1V input reference from U1-16).

SECTION 5

MAINTENANCE

5.1 GENERAL

This section provides troubleshooting data, periodic servicing, calibration and performance testing procedures. The troubleshooting data should be used in conjunction with the schematic diagrams in section 6 and section 4 which outlines the principles of operation. Parts location diagrams located in section 6 may also be referred to.

Any questions pertaining to repair should be directed to the nearest Sorensen representative or to the factory. Include the model and serial numbers in any correspondence. Should it be necessary to return a unit to the factory for repair, prior authorization from Sorensen Company must be obtained.

5.2 PERIODIC SERVICING

Whenever a unit is removed from service, it should be cleaned, using naptha or an equivalent solvent on painted surfaces, and a weak solution of soap and warm water for the front panel. Compressed air may be used to blow dust from in and around components.

Check for fan bearing wear or noise. It is recommended that the fan be replaced after an equivalent of three years of operation at 24 hours per day (approximately 26,000 hours).

5.3 TROUBLESHOOTING

5.3.1 Status Lights

Three panel lights (LED's) are provided which will indicate the probable cause of any trouble.

a) Voltage LED

This LED indicates normal functioning when illuminated.

b) Current LED

This LED indicates either a short or an overload on the output when illuminated.

1. Disconnect load and recheck.
2. Check current limit setting as detailed in section 5.4.

c) Fault LED

This LED indicates that the output has been shut down due to one of the following problems:

1. OVP Tripped

Disconnect load and set the output adjust control for minimum output voltage. Restart after interrupting primary ac power for five seconds. Check for open sense leads (pins 4 and 5 on the panel connector. See Installation section).

2. Inhibit circuit has been activated

Pin 9 on panel connector connected to minus Sense pin 4.

3. Thermal overload has tripped

Verify that the fan is working. Disconnect load and allow the unit to cool. Restart.

5.3.2 No Output

a) Improper ac input voltage.

Check to be sure the supplied ac power is the correct voltage for the unit (M1 is 115 Vac).

b) Check Fuses.

1. F1 ac Fuse blown

Verify input voltage is proper. Check for short on Mother Card (A1).

2. F2 dc Fuse blown

Check power switches Q3 and Q4 on A3 and A4. (See section 5.3.10).

3. F3 on Control Card

Unplug A2 to localize.

c) Check voltage levels per section 5.3.7.

d) Check A2 Control Card per section 5.3.8.

e) Check Base Drive per section 5.3.9.

f) Check Power Transistor per section 5.3.10.

g) Check T1/A5 per section 5.3.11.

5.3.3. Poor Regulation or Incorrect Output Voltage

a) Verify that load is not excessive forcing unit into current limit. Check current limit setting per section 5.4.

- b) Verify that the output adjust pot is properly set for 5.0 volts. If no adjustment is possible, the problem is on Control Card A2. See section 5.3.8. Replace or troubleshoot. U1 is the probable failure.

5.3.4 Current Limit Not Functioning

- a) Check A1-T2 transformer for dc output voltage across C17. Read on A2 Control Card J1 pin 3 to pin 5. Approximately -2.6V should be present at full rated 200A load. (At 100A load, approximately -1.1 volts).
- b) Check A2 Control Card per section 5.3.8. Replace or troubleshoot. U3 is the probable failure.

5.3.5 OVP Not Functioning

- a) Check A2 Control Card per section 5.3.8. Replace or troubleshoot. U3 is the probable failure.

5.3.6 Status Lamps Not Functioning

- a) Check A2 Control Card per section 5.3.8. Replace or troubleshoot. U2 is the probable failure.

5.3.7 Voltage Check

1. Remove A3 and A4 plug-in transistor-heat sink assemblies.
2. Verify that all fuses are good per section 5.3.2.
3. Measure dc voltage using A3 or A4 socket as follows:
 - a) Pin 4 to pin 3 = +15V
 - b) Pin 2 to pin 3 = +4V
 - c) Pin 7 to pin 10 = +300V

5.3.8 Control Card A2 Check

Nearly all of the control functions are accomplished on this card. A spare card can quickly determine whether the A2 card is the source of the problem.

1. Remove A3 and A4 plug-in transistor-heat sink assemblies.
2. Verify F3 fuse is good per section 5.3.2.
3. Using A2 J1 terminals, verify the following voltages and waveforms:
 - a) Pin 8 to pin 7* = +4V
 - b) Pin 6 to pin 7* = +15V
 - c) Pin 9 to pin 7* = Waveform of Figure A.
 - d) Pin 10 to pin 7* = Waveform of Figure A.

* Pin 7 is the common return and is also available on VR1 anode. The probable cause of an incorrect waveform is U3.

4. Refer to sections 5.3.2 through 5.3.6 for probable cause of failure on the A2 card.

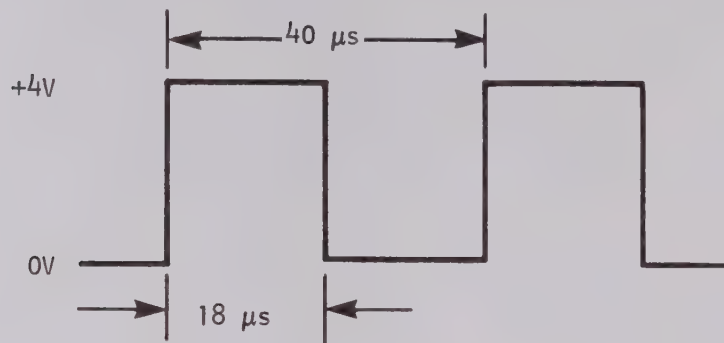


Figure A

5.3.9 Base Drive Check

1. Check A2 waveform per section 5.3.8.
2. Check voltages at A3 and A4 per 5.3.7.
3. Remove A3 and A4 assemblies from sockets X2 and X3.
4. Using the inside (X2) connector, test out each A3/A4 assembly in turn.
5. Check V_{BE} of Q3 and Q4 by connecting an oscilloscope across R5 and R6. The waveform should be as shown in Figure B.

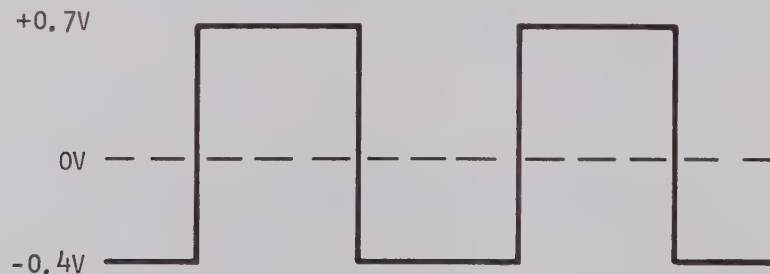


Figure B

5.3.10 Power Transistor Switches Blown

If Q3 - Q4 on A3 or A4 are open or shorted (ohmmeter check), replace defective parts. Do not restart unit before checking the Base Drive per section 5.3.9.

5.3.11 Power Transformer/Output Card A5 Check

This check should be made only after 5.3.7 through 5.3.10 tests have been performed.

1. With all cards and fuses in place, connect ac current probe (capable of reading 7A peak at 40 kHz) as follows:
 - a) On A5 PCB, locate P1 (2 lead plug). There is a soldered lead wired to socket X1 (upper terminal of X1). Loop current probe around this wire (which is the primary lead of T1).
 - b) Verify current waveform as shown in Figure C with the oscilloscope connected to the current probe. Note that a symmetrical waveform must be present, indicating that all four power transistors are functioning properly. The 7A peak is shown for a 200A output current and nominal ac line voltage.
 - c) Narrow current pulses indicate current limiting caused by either load short or by shorted T1 or A5 components.

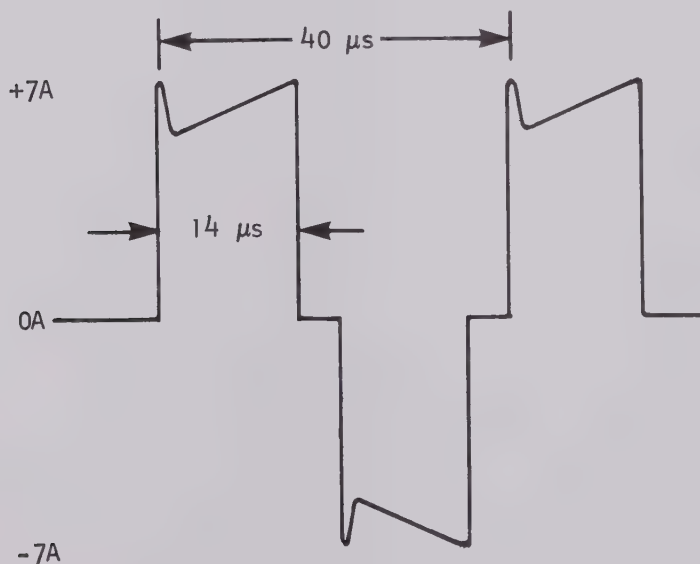


Figure C

5.4 CURRENT LIMIT SETTING

To properly set the current limiter, a load that is variable from 0 to 220A is required.

1. Set R14 limit adjust on the A2 board to half scale.
2. With no load, set output adjust R36 on the A2 board (front panel adjustment) to 5.000 Vdc.

3. Slowly increase the load until the output falls below 5.0 Vdc. Then advance the setting of R14.
4. With a 200A load, R14 should be set to hold the output at 5.000 Vdc.
5. Set R14 to drop the output to 4.9 Vdc (approximately) at a load of 210A. Recheck step 4.
6. With a short circuit across the output, load current will drop to approximately 150A.

SECTION 6

DRAWINGS AND PARTS LISTS

6.1 GENERAL

This section contains system and sub-system schematic drawings, assembly drawings and parts lists.

The order of appearance of the drawings is by assembly reference designator. Each assembly will be presented in the following order:

1. Schematic Diagram
2. Assembly Drawing
3. Replaceable Parts List

Should the schematic for a particular sub-assembly be presented in an earlier schematic, only the assembly drawing will be shown.

6.2 TABLE HEADINGS DEFINED

6.2.1 Circuit Symbol

This is an alpha-numeric identification of the component as called out on the unit drawings.

6.2.2 Sorensen Part Number

This number should be used when ordering parts directly from:

Sorensen Company
Replacement Parts Dept.
676 Island Pond Road
Manchester, NH 03103

NOTES

1. UNLESS OTHERWISE SPECIFIED
 - a. ALL RESISTORS ARE MEASURED IN OHMS.
 - b. ALL CAPACITORS ARE MEASURED IN MICROFARADS.

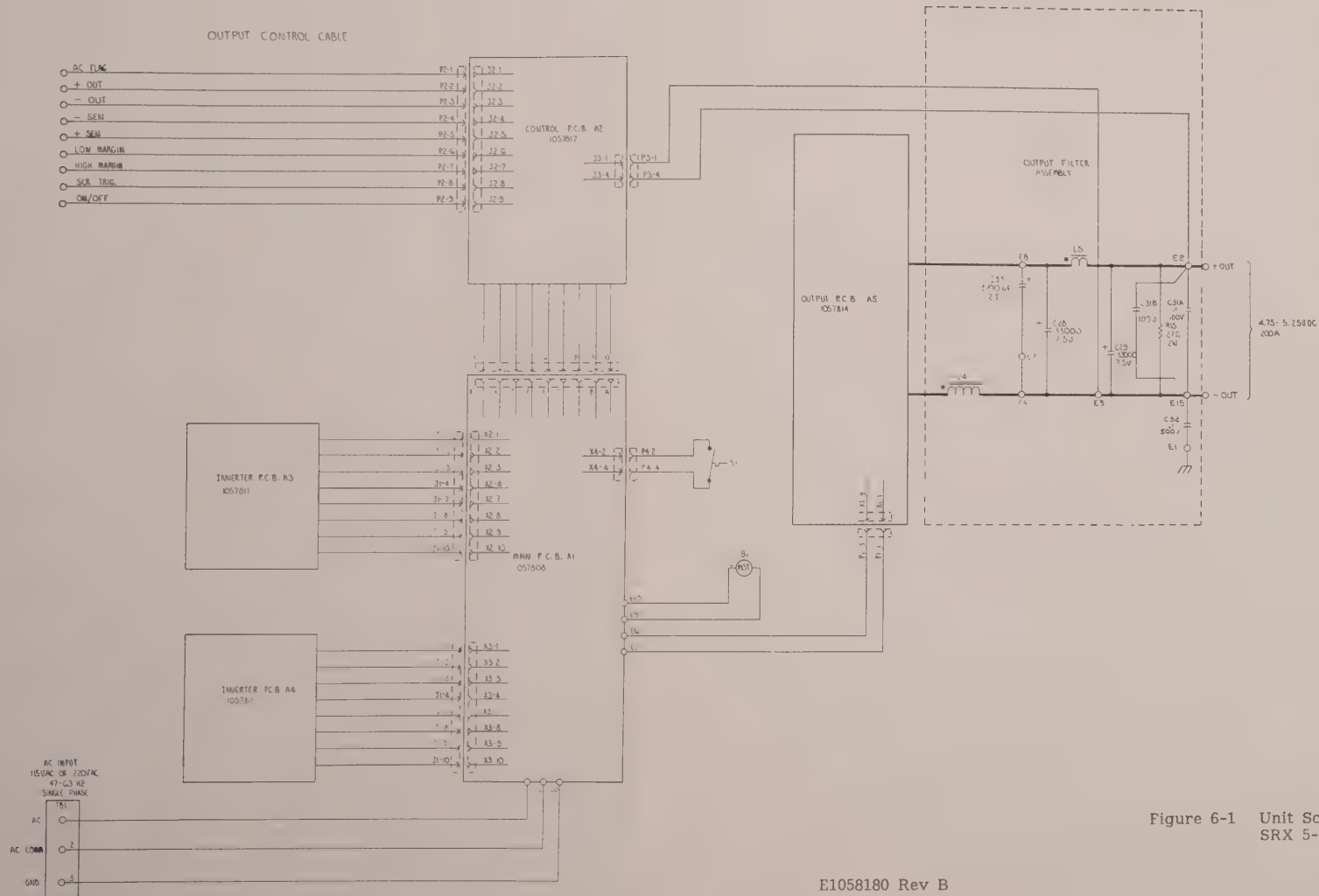


Figure 6-1 Unit Schematic
SRX 5-200

PRODUCT LABEL MARKING									
ASSEMBLY NO.	MODEL NO.	INPUT			OUTPUT			SERIAL NO.	
		V	H _z	A	V	H _z	A		
1058130-1	SRX5-200M1	95-27	47-63	20	4-75	5-25	100	A/R	
1058130-2	SRX5-200	190-250		20					
1058130-3	SRX5-200M2	95-27		20					
1058130-4	SRX5-200M3	190-250	47-63	12	4-75	5-25	200	A/R	

NOTES:

- 1 MARK WITH $\frac{1}{32}$ "-HIGH EMBOSSED CHARACTERS PER MARKING TABLE.
- 2 SEAL CURRENT LIMIT POT WITH FKNQ AFTER FINAL TEST PER THE APPLICABLE TEST PROCEDURE.

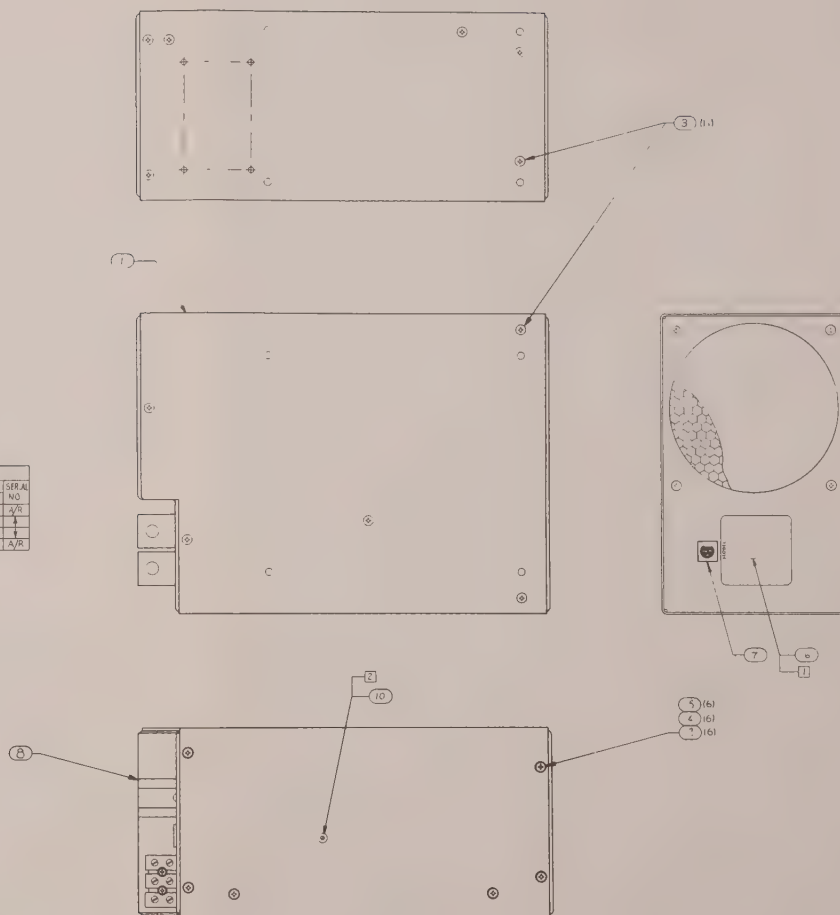


Figure 6-2 Final Assembly
SRX 5-200

NOTES:

- 1 LEAVE BLANK FOR ASSY 1058131-2. FOR OTHER DASH NO.'S, STAMP APPLICABLE "M" NO. IN $\frac{3}{16}$ " HIGH CHARACTERS USING BLACK EPOXY INK PER MARKING TABLE.

MARKING TABLE	
ASSY NO.	STAMP
1058131-1	M1
1058131-3	M2
1058131-4	M3

- 2 TORQUE BOLT ON OTHER END OF THIS BUSS BAR TO 70 IN-LBS (REF DWG 1058133.)

- 3 ATTACH LABEL TO SIDE OF CAPACITOR AS SHOWN.

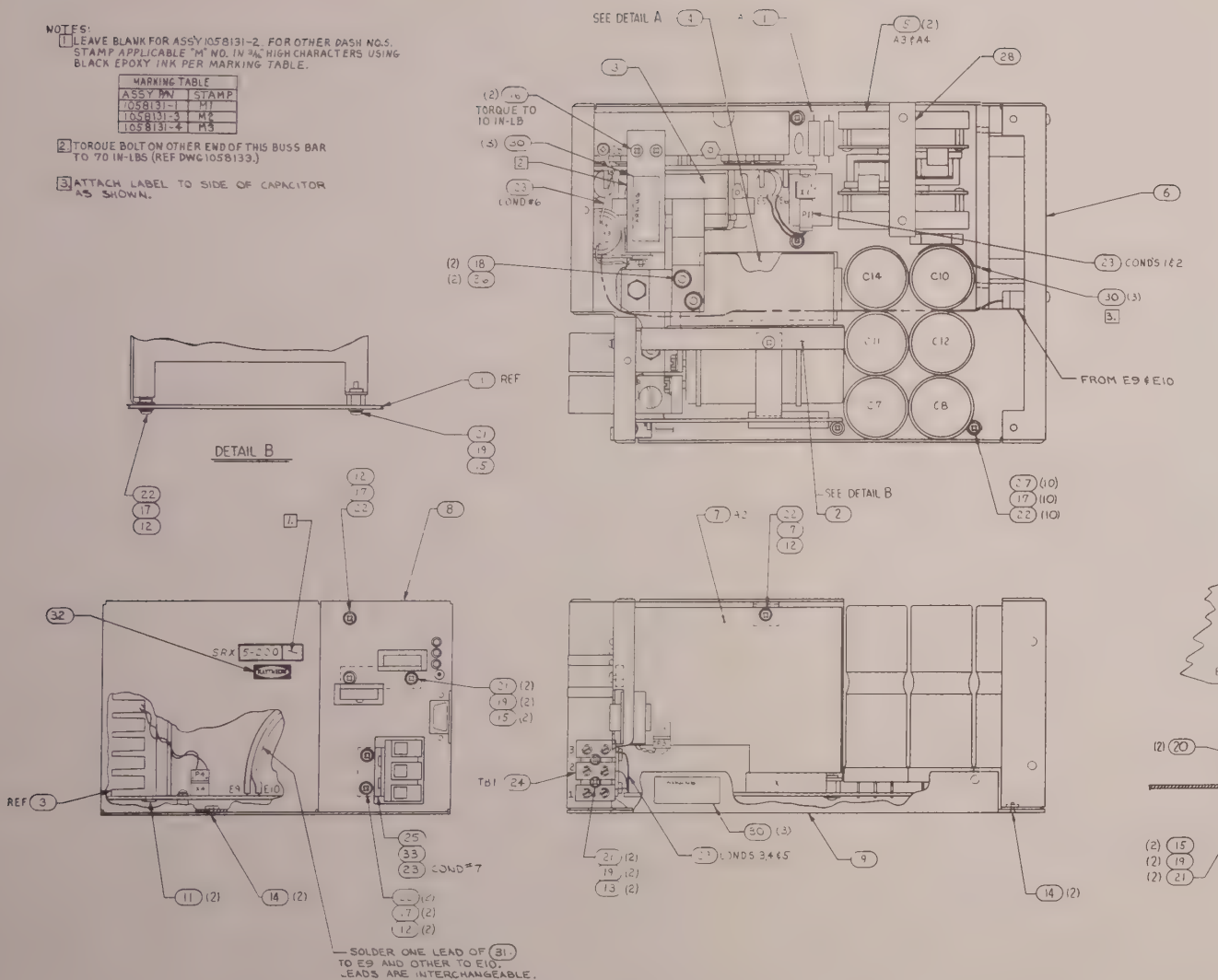


Figure 6-3 Main Assembly
SRX 5-200

Table 6-1
Parts List
SRX 5-200 220V
S20001

<u>Location</u>	<u>Description</u>	<u>Part Number</u>	<u>Symbol</u>
1	F/A SRX 5-200 P.S.	1058130-2	
2	Connector	1058159-1	
3	Pin, Connector	1058164-1	

Table 6-2
Parts List
F/A SRX 5-200 P.S.
1058130-2

<u>Location</u>	<u>Description</u>	<u>Part Number</u>	<u>Symbol</u>
1	Cover	1057831-1	
2	PHMS, 6-32 X 1/4, 100°	6-2002-24	
3	FHMS, 6-32 X 1/4, 100°	6-2020-17	
4	Washer, Flat, #6	6-4000-14	
5	Washer, Lock, #6	6-4012-3	
6	Data Name Plate	91-1543	
7	Nameplate, CSA	1058494-1	
8	Main Assembly	1058131-2	

Table 6-3
Replaceable Parts List
Main Assembly
1058131-2

<u>Location</u>	<u>Description</u>	<u>Part Number</u>	<u>Symbol</u>
	Main PCB Sub-Assembly	1057810	A1
	Control PCB Assembly	1057819-1	A2
	Inverter PCB Assembly	1057813-1	A3
	Inverter PCB Assembly	1057813-1	A4
	Terminal Strip	1058168-1	TB1

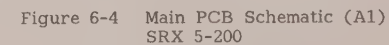
Table 6-4
Parts Location List
Main Assembly
1058131-2

<u>Location</u>	<u>Description</u>	<u>Part Number</u>	<u>Symbol</u>
1	Main PCB Sub-Assembly	1057810-2	A1
2	Output Filter Assembly	1058133-1	
3	Output Rectifier Assembly	1058134-1	
4	Input Rectifier Assembly	1058135-1	

Table 6-4 (Cont'd)
Parts Location List
Main Assembly
1058131-2

<u>Location</u>	<u>Description</u>	<u>Part Number</u>	<u>Symbol</u>
5	Inverter PCB Assembly	1057813-1	A3
	Inverter PCB Assembly	1057813-1	A4
6	Rear Panel Assembly	1058132-2	
7	Control PCB Assembly	1057819-1	A2
8	Front Panel	1057833-3	
9	Chassis	1058016-1	
11	FHMS, 10-32 X 3/8, 100°	6-2020-49	
12	PHMS, 6-32 X 3/16	6-2002-25	
13	PHMS, 4-40 X 7/8	6-2001-72	
14	FHMS, 6-32 X 1/4, 100°	6-2020-17	
15	PHMS, 4-40 X 1/4	6-2002-13	
16	BHMS, 8-32 X 3/8, Brass	207-7183P2	
17	Washer, Lock, #4	6-4012-2	
18	Nut, 8-32, HIL, CS	2-361	
19	Washer, Lock, #4	6-4012-2	
20	Standoff, Hex	210-7194P10	
21	Washer, Flat, #4, SS	6-4000-13	
22	Washer, Flat, #6, SS	6-4000-14	
23	Cable and Jumper Assembly	1058168-1	
24	Terminal Strip	1058168-1	TB1
25	Bracket, Terminal Block	1058139-1	
26	Washer, Flat, #8	6-4000-5	
27	PHMS, 6-32 X 5/16	6-2002-27	
28	Bracket, Spacing	1058192-1	
30	Label, Fuse Warning	1058072-1	
31	Cord, Fan	1036182-1	
32	Nameplate	1058468-1	
33	Nut, 6-32, HIL, CS	2-360	

- UNLESS OTHERWISE SPECIFIED
 - a. ALL RESISTORS ARE MEASURED IN OHMS
 - b. ALL CAPACITORS ARE MEASURED IN MICROFARADS
- ☐ T2 PRIMARY CONSISTS OF LKG.



NOTES

1. ELECTRICAL COMPONENTS ARE KEYED TO PARTS LIST BY REFERENCE DESIGNATION.
2. REFERENCE SCHEMATIC NUMBER 001003
3. LK 5 & LK 6 MUST BE DANG AGAINST COIL.
4. DOUBLE WIRE TWM LEAD MUST GO TO E15. SINGLE WIRE LEADS FOR E14 AND E16 ARE INTERCHANGEABLE. MOUNT AND SOLDER RESISTOR LEADS IN CENTER HOLE OF TERMINAL.

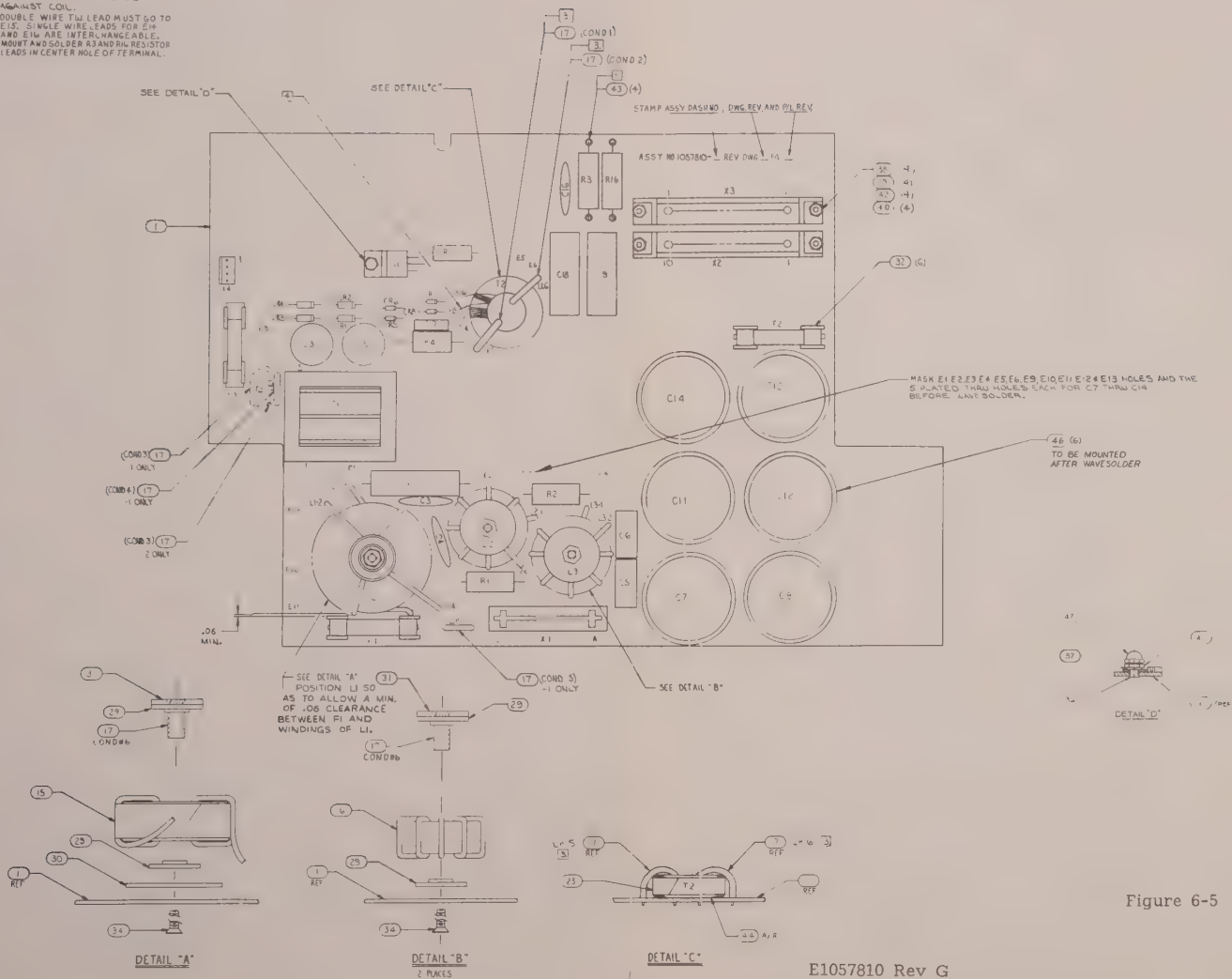


Figure 6-5 Main PCB Assembly (A1)
SRX 5-200

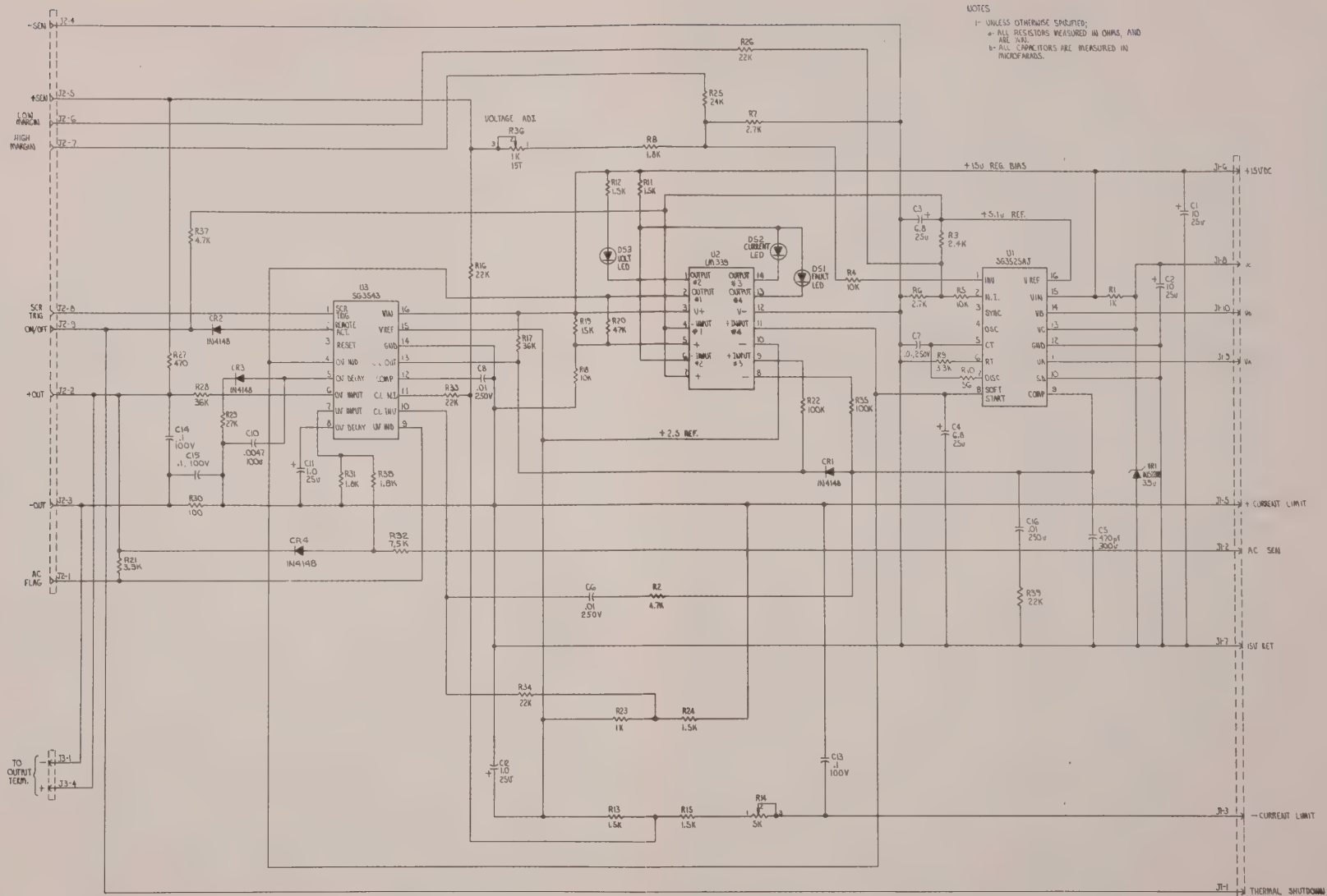
E1057810 Rev G

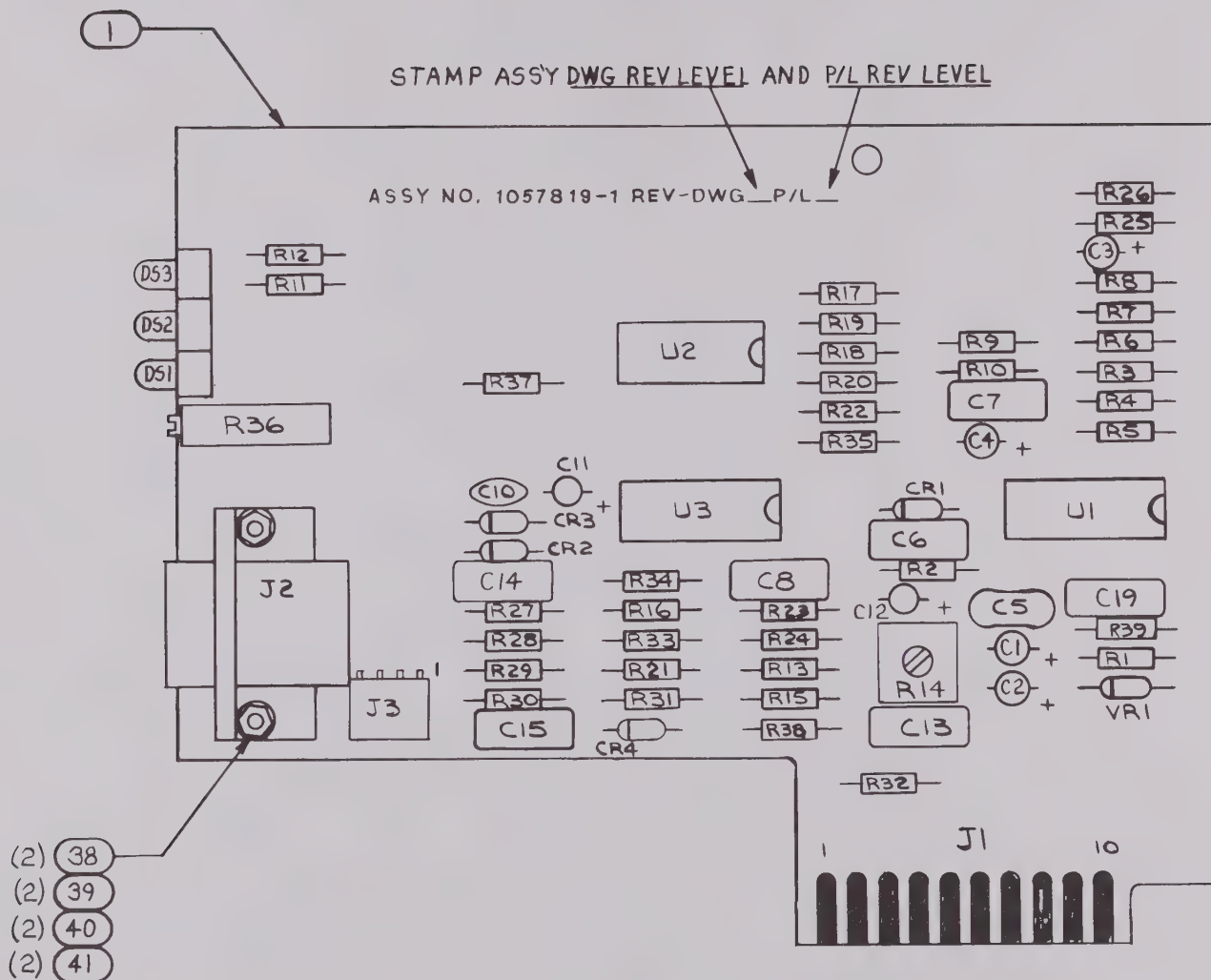
Table 6-5
Replaceable Parts List
Main PCB Sub-Assembly (A1)
1057810-2

<u>Location</u>	<u>Description</u>	<u>Part Number</u>	<u>Symbol</u>
	Cap, 0.68 μ F, 600V	587626-103	C2
	Cap, 0.01 μ F, 1600V	235-7207P30	C3
	Cap, 0.01 μ F, 1600V	235-7207P30	C4
	Cap, 0.33 μ F, 250V	24-2015-19	C5
	Cap, 1375 μ F, 200V	1058064-1	C6
	Cap, 1375 μ F, 200V	1058064-1	C7
	Cap, 1375 μ F, 200V	1058064-1	C8
	Cap, 1375 μ F, 200V	1058064-1	C10
	Cap, 1375 μ F, 200V	1058064-1	C11
	Cap, 1375 μ F, 200V	1058064-1	C12
	Cap, 1375 μ F, 200V	1058064-1	C14
	Cap, 680 μ F, 50V	105857-34	C15
	Cap, 0.0047 μ F, 500V	235-7207P23	C16
	Cap, 0.1 μ F, 100V	24-2037-7	C17
	Cap, 1.8 μ F, 250V	24-2015-28	C18
	Cap, 1.8 μ F, 250V	24-2015-28	C19
	Cap, 680 μ F, 50V	165857-34	C30
	Diode, S12, SEN-R-29	587565-2	CR1
	Diode, S12, SEN-R-29	587565-2	CR2
	Diode, S12, SEN-R-29	587565-2	CR3
	Diode, S12, SEN-R-29	587565-2	CR4
	Diode, 1N4606	585155-1	CR5
	Diode, 1N4606	585155-1	CR6
	Diode, 1N4606	585155-1	CR7
	Diode, 1N4606	585155-1	CR8
	Fuse, 15A, 250V	42-1811	F1
	Fuse, 8A, 250V	42-430	F2
	Fuse, 5A, 250V	226-7176P15	F3
	Choke, Input, ac RFI	1058124-1	L1
	Choke, Input, dc RFI	1058125-1	L2
	Choke, Input, dc RFI	1058125-1	L3
	Res, 47K, 2W	280-1147P134	R1
	Res, 47K, 2W	280-1147P134	R2
	Res, 200, 5W	280-7181P41	R3
	Res, 100, 2W	280-1147P38	R4
	Res, 390, 1W	280-1146P59	R5
	Res, 200, 5W	280-7181P41	R16
	Transformer	1058060-18	T1
	Transformer, Current Sense	1058123-1	T2
	IC, SG7815ACD	1058062-1	U1
	Connector, Edge	1057683-15	X1
	Connector	1058165-2	X2
	Connector	1058165-2	X3
	Connector	1058179-1	X4
29	Washer, Shoulder	1058194-1	
30	Washer, Insulating	168269-2	

Table 6-5 (Cont'd)
 Replaceable Parts List
 Main PCB Sub-Assembly (A1)
 1057810-2

<u>Location</u>	<u>Description</u>	<u>Part Number</u>	<u>Symbol</u>
31	Washer Assembly	1057997-1	
32	Clip, Fuse	585804-1	
34	FHMS, 6-32 X 1, 100°	6-2020-25	
36	FHMS, 4-40 X 7/16, 100°	6-2020-5	
37	Washer, Lock, #4	6-4012-2	
38	FHMS, 2-56 X 1/2	207-7196P13	





NOTES:
ELECTRICAL COMPONENTS ARE KEYED TO
PARTS LIST BY REFERENCE DESIGNATION.
REFERENCE SCHEMATIC NUMBER 1057817.

D1057819 Rev B

Figure 6-7 Control PCB Assembly (A2) SRX 5-200

Table 6-6
Replaceable Parts List
Control PCB Assembly (A2)
1057819-1

<u>Location</u>	<u>Description</u>	<u>Part Number</u>	<u>Symbol</u>
	Cap, 10 μ F, 25V	235-7395P65	C1
	Cap, 10 μ F, 25V	235-7395P65	C2
	Cap, 6.8 μ F, 25V	235-7395P64	C3
	Cap, 6.8 μ F, 25V	235-7395P64	C4
	Cap, 470 pF, 300V	235-7053P156	C5
	Cap, .01 μ F, 250V	24-2015-1	C6
	Cap, .01 μ F, 250V	24-2015-1	C7
	Cap, .01 μ F, 250V	24-2015-1	C8
	Cap, .0047 μ F, Mylar	235-7193P3	C10
	Cap, 1.0 μ F, 35V	235-7395P76	C11
	Cap, 1.0 μ F, 35V	235-7395P76	C12
	Cap, .1 μ F, 100V	24-2037-7	C13
	Cap, .1 μ F, 100V	24-2037-7	C14
	Cap, .1 μ F, 100V	24-2037-7	C15
	Cap, .01 μ F, 250V	24-2015-1	C16
	Diode, 1N4148, S	322-7220P1	CR1
	Diode, 1N4148, S	322-7220P1	CR2
	Diode, 1N4148, S	322-7220P1	CR3
	Diode, 1N4148, S	322-7220P1	CR4
	LED	1058128-1	DS1
	LED	1058128-1	DS2
	LED	1058128-1	DS3
	Connector	1058162-1	J2
	Conn Elec	1058166-1	J3
	Res, 1.0K, 1/4W	585108-11	R1
	Res, 4.7K, 1/4W	585108-43	R2
	Res, 2.4K, 1/4W	585108-29	R3
	Res, 10K, 1/4W	585108-59	R4
	Res, 10K, 1/4W	585108-59	R5
	Res, 2.7K, 1/4W	585108-31	R6
	Res, 2.7K, 1/4W	585108-31	R7
	Res, 1.8K, 1/4W	585108-23	R8
	Res, 3.3K, 1/4W	585108-35	R9
	Res, 56 Ω , 1/4W	585108-2	R10
	Res, 1.5K, 1/4W	585108-19	R11
	Res, 1.5K, 1/4W	585108-19	R12
	Res, 1.5K, 1/4W	585108-19	R13
	Res, V, 5.0K, 1/2W	586370-15	R14
	Res, 1.5K, 1/4W	585108-19	R15
	Res, 22K, 1/4W	585108-117	R16
	Res, 36K, 1/4W	585108-127	R17
	Res, 10K, 1/4W	585108-59	R18
	Res, 15K, 1/4W	585108-109	R19
	Res, 47K, 1/4W	585108-133	R20
	Res, 3.3K, 1/4W	585108-35	R21
	Res, 100K, 1/4W	585108-149	R22
	Res, 1.0K, 1/4W	585108-11	R23

Table 6-6
Replaceable Parts List
Control PCB Assembly (A2)
1057819-1

<u>Location</u>	<u>Description</u>	<u>Part Number</u>	<u>Symbol</u>
	Res, 1.5K, 1/4W	585108-19	R24
	Res, 24K, 1/4W	585108-119	R25
	Res, 22K, 1/4W	585108-117	R26
	Res, 470 Ω , 1/4W	585108-87	R27
	Res, 36K, 1/4W	585108-127	R28
	Res, 27K, 1/4W	585108-121	R29
	Res, 100 Ω , 1/4W	585108-8	R30
	Res, 1.8K, 1/4W	585108-23	R31
	Res, 7.5K, 1/4W	585108-53	R32
	Res, 22K, 1/4W	585108-117	R33
	Res, 22K, 1/4W	585108-117	R34
	Res, 100K, 1/4W	585108-149	R35
	Res, V, 1.0K, 3/4W	586371-4	R36
	Res, 4.7K, 1/4W	585108-43	R37
	Res, 1.8K, 1/4W	585108-23	R38
	Res, 22K, 1/4W	585108-117	R39
	IC, SG3525AJ	1058063-1	U1
	IC	166970-1	U2
	IC, SG3543	1058061-1	U3
	Diode, Z, 1N5228B	588101-5	VR1
38	FHMS, 2-56 X 5/16, SS	207-7196P7	
39	Washer, Flat, #2	6-4000-2	
40	Washer, Lock, #2	6-4012-1	
41	Nut, Hex, 2-56, SS	6-3000-1	

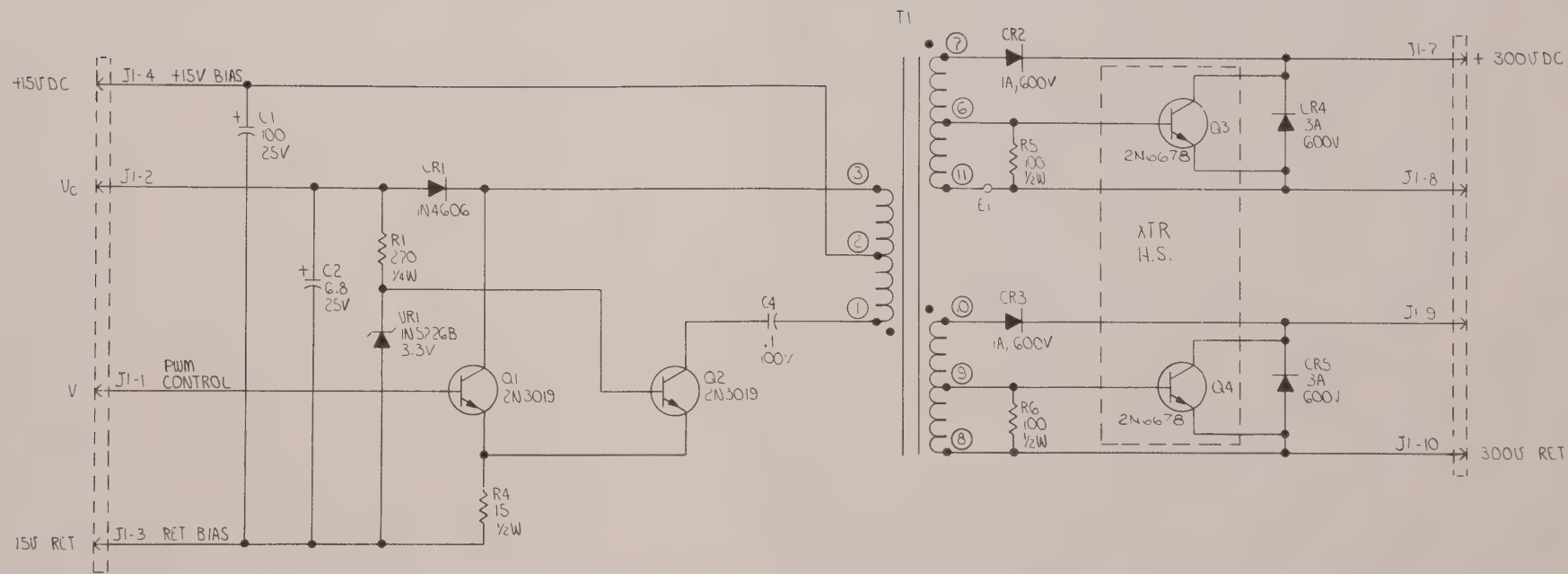
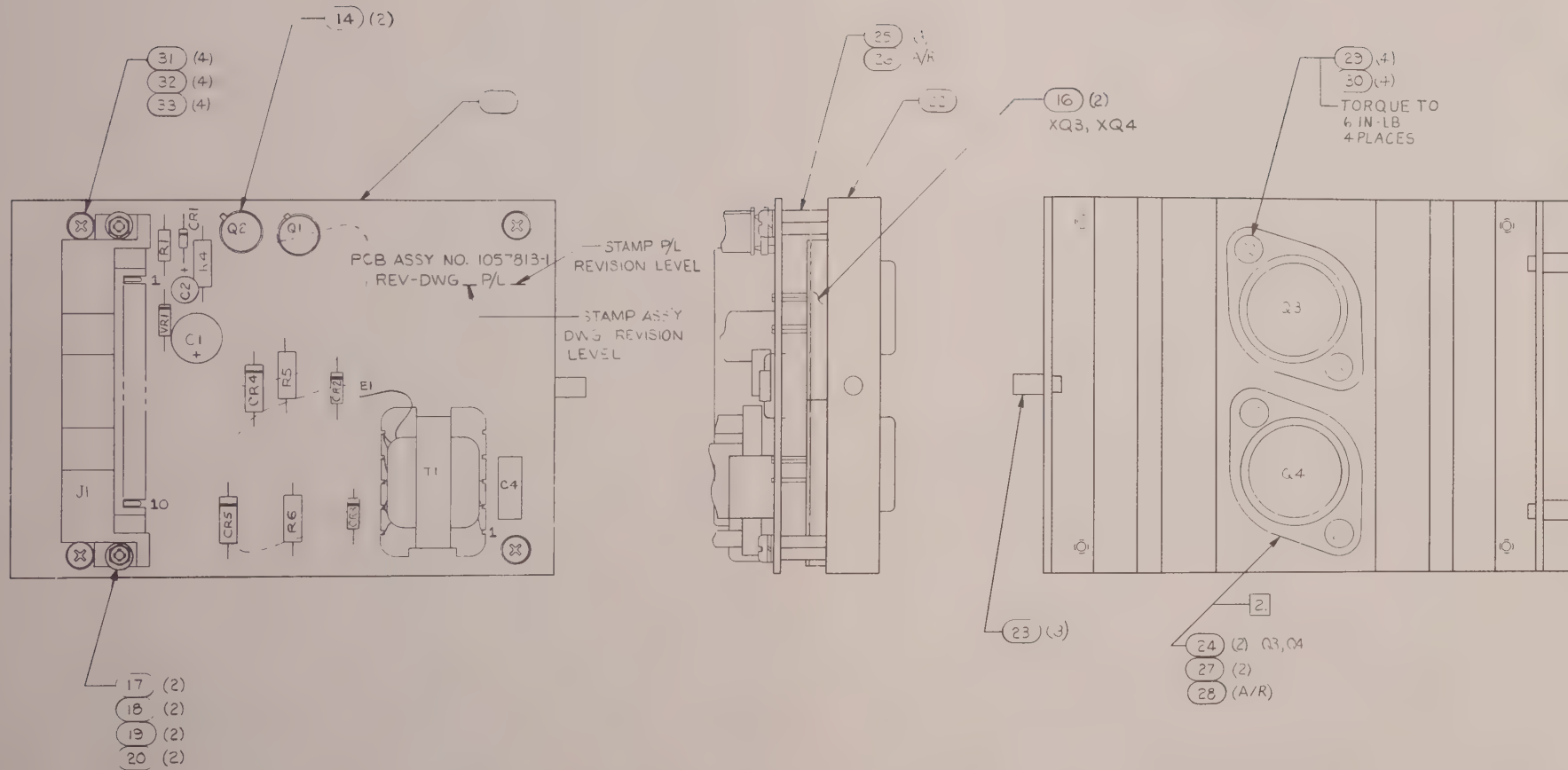


Figure 6-8 Inverter PCB
Schematic (A3 and A4)



NOTES:
 1. ALL ELECTRICAL COMPONENTS ARE KEYED TO PARTS LIST BY REF. DESIGNATIONS.
 2. HIGH POT Q3 & Q4 AT 500 VDC.

Figure 6-9 Inverter PCB Assembly (A3 and A4)

Table 6-7
Replaceable Parts List
Inverter PCB Assembly (A3 and A4)
1057813-1

<u>Location</u>	<u>Description</u>	<u>Part Number</u>	<u>Symbol</u>
	Cap, 100 μ F, 25V	165857-9	C1
	Cap, 6.8 μ F, 25V	235-7395P64	C2
	Cap, .1 μ F, 100V	24-2037-7	C4
	Diode, 1N4606	585155-1	CR1
	Rect SIF6	586379-8	CR3
	Diode, 3SF4	586378-4	CR4
	Diode, 3SF4	586378-4	CR5
	Connector	1058161-1	J1
	2N3019	386-7316P1	Q1
	2N3019	386-7316P1	Q2
	Xstr, 2N6678	1034499-8	Q3
	Xstr, 2N6678	1034499-8	Q4
	Res, 270 Ω , 1/4W	585108-75	R1
	Res, 15 Ω , 1/2W	585326-27	R4
	Res, 100 Ω , 1/2W	585326-67	R5
	Res, 100 Ω , 1/2W	585326-67	R6
	Xfmr Assy Base Drv	1058122-1	T1
	Diode, Z, 1N5226B	588101-3	VR1
	Socket, Pwr Xstr	1032586-1	XQ3
	Socket, Pwr Xstr	1032586-1	XQ4
14	Pad	586795-1	
17	FHMS, 2-56 X 3/8	207-7196P9	
18	Washer, Flat, #2	6-4000-2	
19	Washer, Lock, #2	6-4012-1	
20	Nut, Hex, 2-56, SS	6-3000-1	
22	Heatsink, Inverter, Anodized	1057770-2	
23	Spacer, Telfon	166920-2	
25	Standoff, Hex	21-7194P2	
27	Xstr, Insulator	222-7188P12	
29	Washer, Lock, #6	6-4012-3	
30	PHMS, 6-32 X 7/16	6-2002-26	
31	Washer, Flat, #4, SS	6-4000-13	
32	Washer, Lock, #4	6-4012-2	
33	PHMS, 4-40 X 1/4	6-2002-12	

SELF LEAD ITEMS		
FROM	TO	ATTACH ITEMS
C32	E1	
	E15	
R15	C28(+)	
	C28(-)	
C31A	E2	
C31B	E15	
C33(+)	E8	
C33(-)	E7	

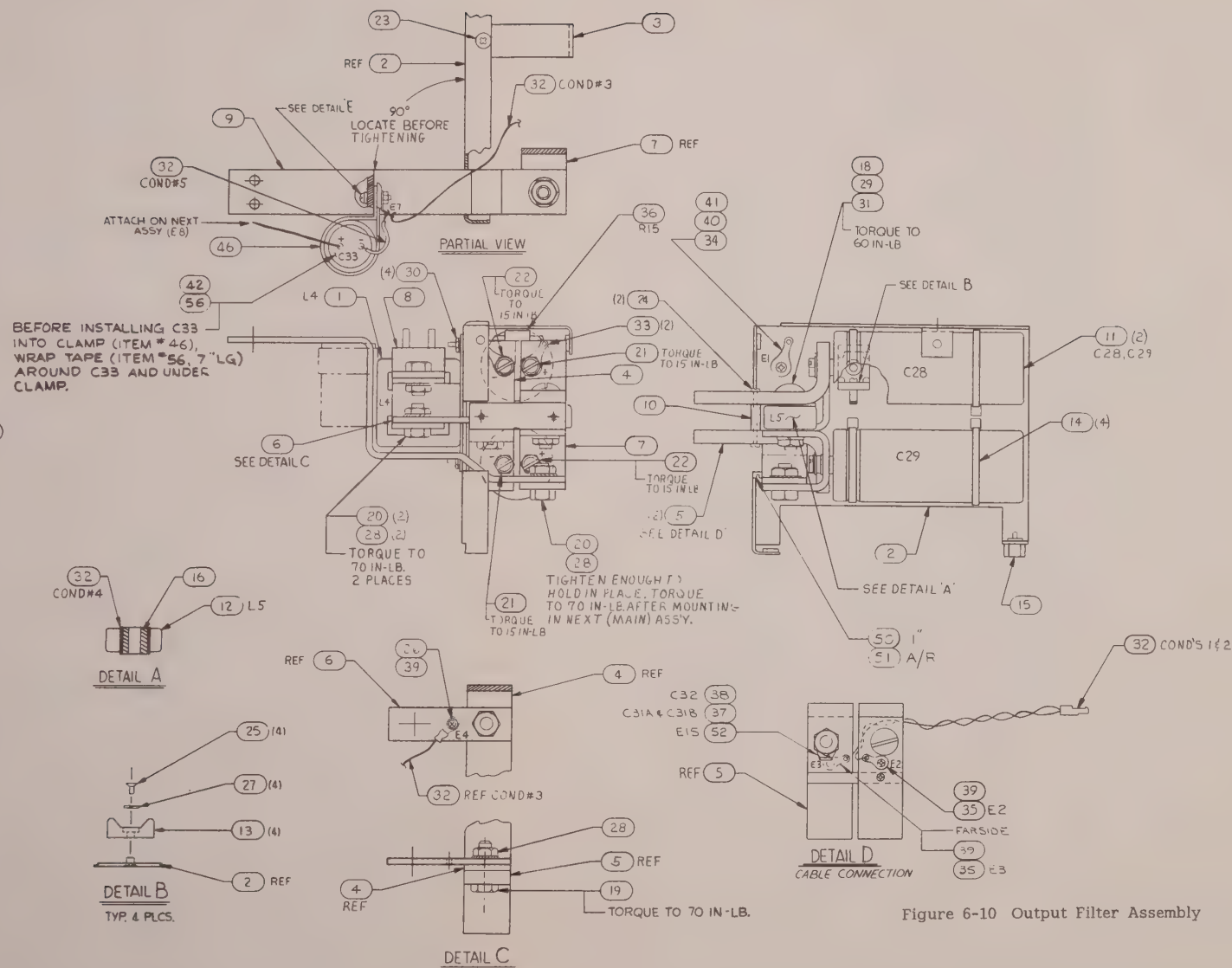
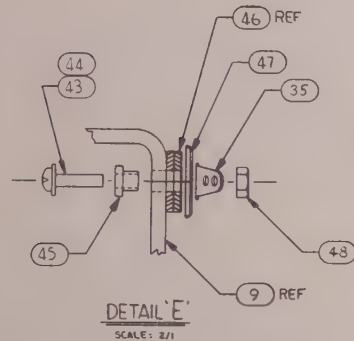


Table 6-8
Replaceable Parts List
Output Filter Assembly
1058133-1

<u>Location</u>	<u>Description</u>	<u>Part Number</u>	<u>Symbol</u>
	Cap, 33K μ F, 7.5V	1058065-4	C28
	Cap, 33K μ F, 7.5V	1058065-4	C29
	Cap, 0.1 μ F, 100V	235-7207P40	C31A
	Cap, 0.1 μ F, 100V	235-7207P40	C31B
	Cap, 0.1 μ F, 500V	235-7207P41	C32
	Cap, 37K μ F, 12V	1057549-5	C33
	Choke Assembly	1058126-1	L4
	Core, Toroid	297-7221P1	L5
	Res, 27, 2W	280-1147P17	R15

Table 6-9
Parts Location List
Output Filter Assembly
1058133-1

<u>Location</u>	<u>Description</u>	<u>Part Number</u>	<u>Symbol</u>
1	Choke Assembly	1058126-1	L4
2	Bracket, Cap	1058017-1	
3	Bracket, PCB	1058074-1	
4	Bus, Neg Cap, Plated	1058019-2	
5	Bus, Output, Plated	1058022-2	
6	Bus, Choke Interconnection	1058021-2	
7	Bus, Pos Cap, Plated	1058108-2	
8	Bus, Sec Choke, W/Ins	1058024-3	
9	Bus, Heatsink, Plated	1058025-2	
10	Block, Output Terminal	1058084-1	
11	Cap, 33K μ F, 7.5V	1058065-4	C28
	Cap, 33K μ F, 7.5V	1058065-4	C29
12	Core, Toroid	297-7221P1	L5
13	Tie Wrap Anchor	297-7193P3	
14	Clamp	362-7195P3	
15	Standoff	1058195-1	
16	Spacer, Brass	1058196-1	
18	RHMS, 1/4-20 X 1 1/4, Brass	6-1102	
19	HHMS, 1/4-20 X 7/8	207-1161P7	
20	HHMS, 1/4-20 X 1/2	207-1161P3	
21	HWMS, 10-32 X 1/2	207-7209P73	
22	HWMS, 10-32 X 3/8	207-7209P71	
23	FHMS, 6-32 X 1/4, 100°	6-2020-17	
24	PHMS, 4-40 X 7/16	207-7195P169	
25	FHMS, 4-40 X 3/16, 100°	6-2020-1	
26	Washer, Lock, #4	6-4012-2	
27	Washer, Lock, #8	6-4012-4	
28	Nut, 1/4-20, Captive Washer	2-364	
29	Nut, Hex, 1/4-20	6-1900	

Table 6-9 (Cont'd)
Parts Location List
Output Filter Assembly
1058133-1

<u>Location</u>	<u>Description</u>	<u>Part Number</u>	<u>Symbol</u>
30	Nut, 4-40, Shakeproof	2-649	
31	Washer, Flat, 1/4	3-151	
32	Sense Cable	1058138-1	
33	Terminal Lug, Solder	4-163	
34	Lug, #6	4-114	
35	Lug, #4	4-113	
36	Res, 27, 2W	280-1147P17	R15
37	Cap, 0.1 μ F, 100V	235-7202P40	C31A
	Cap, 0.1 μ F, 100V	235-7207P40	C31B
38	Cap, 0.1 μ F, 500V	235-7207P41	C32
39	PHMS, 4-40 X 1/4	6-2002-12	
40	PHMS, 6-32 X 5/16	6-2002-24	
41	Nut, 6-32, HIL, CS	2-360	
42	Cap, 37K μ F, 12V	1057549-5	C33
43	PHMS, 4-40 X 1/2	6-2002-17	
44	Washer, Flat, #4, SS	6-4000-3	
45	Bushing	42-964-3	
46	Clamp, Cable	214-1015P14	
47	Washer, D	214-7186P2	
48	Nut, Hex, 4-40, SS	6-3000-2	
50	Grommet, Caterpillar	359-7205P1	

SELF LEAD CHART	
REF	TO
DES	
R1	A5
	CR1-A
R2	A5
	CR2-A
R3	A5
	CR3-A
R4	A5
	CR4-A
R5	A5
	CR5-A
R6	A5
	CR6-A
R7	A5
	CR7-A
R8	A5
	CR8-A

FILL RIVETED JOINT WITH SOLDER. INSIDE OF RING TO BE FREE OF EXCESS SOLDER.

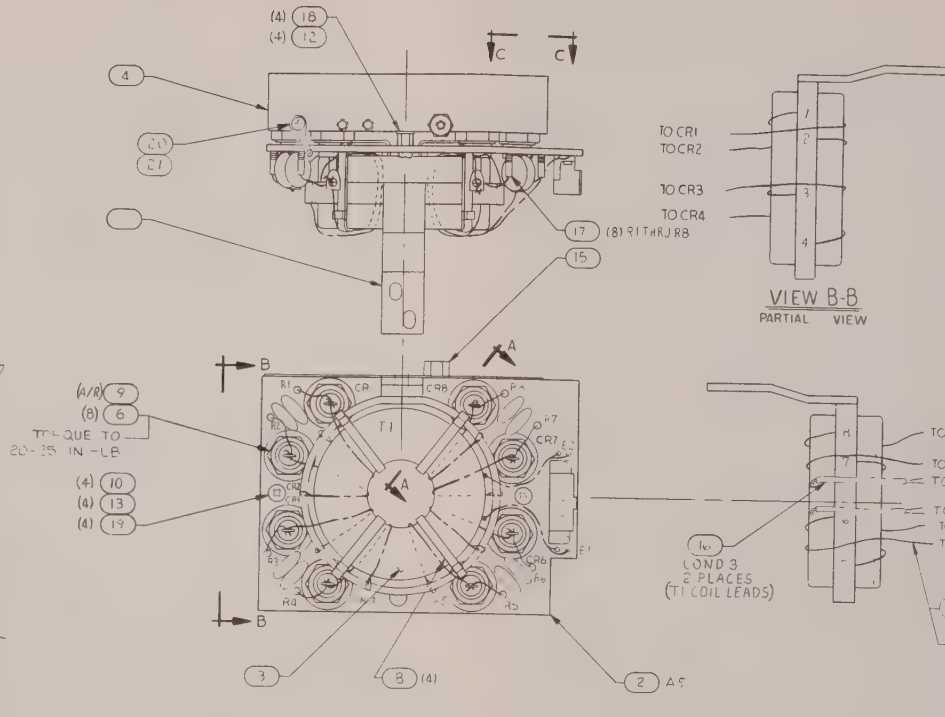
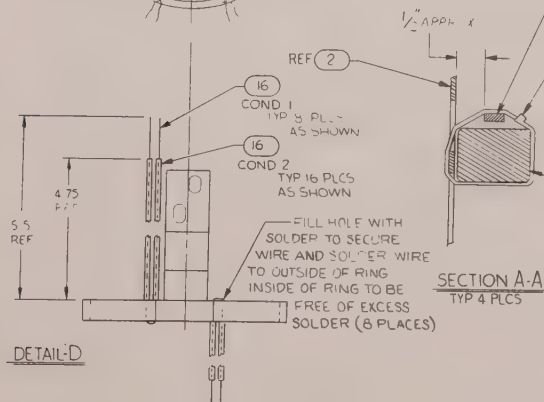
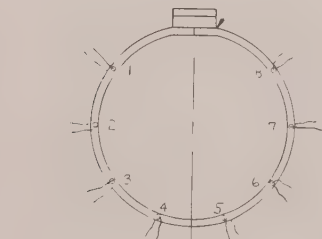


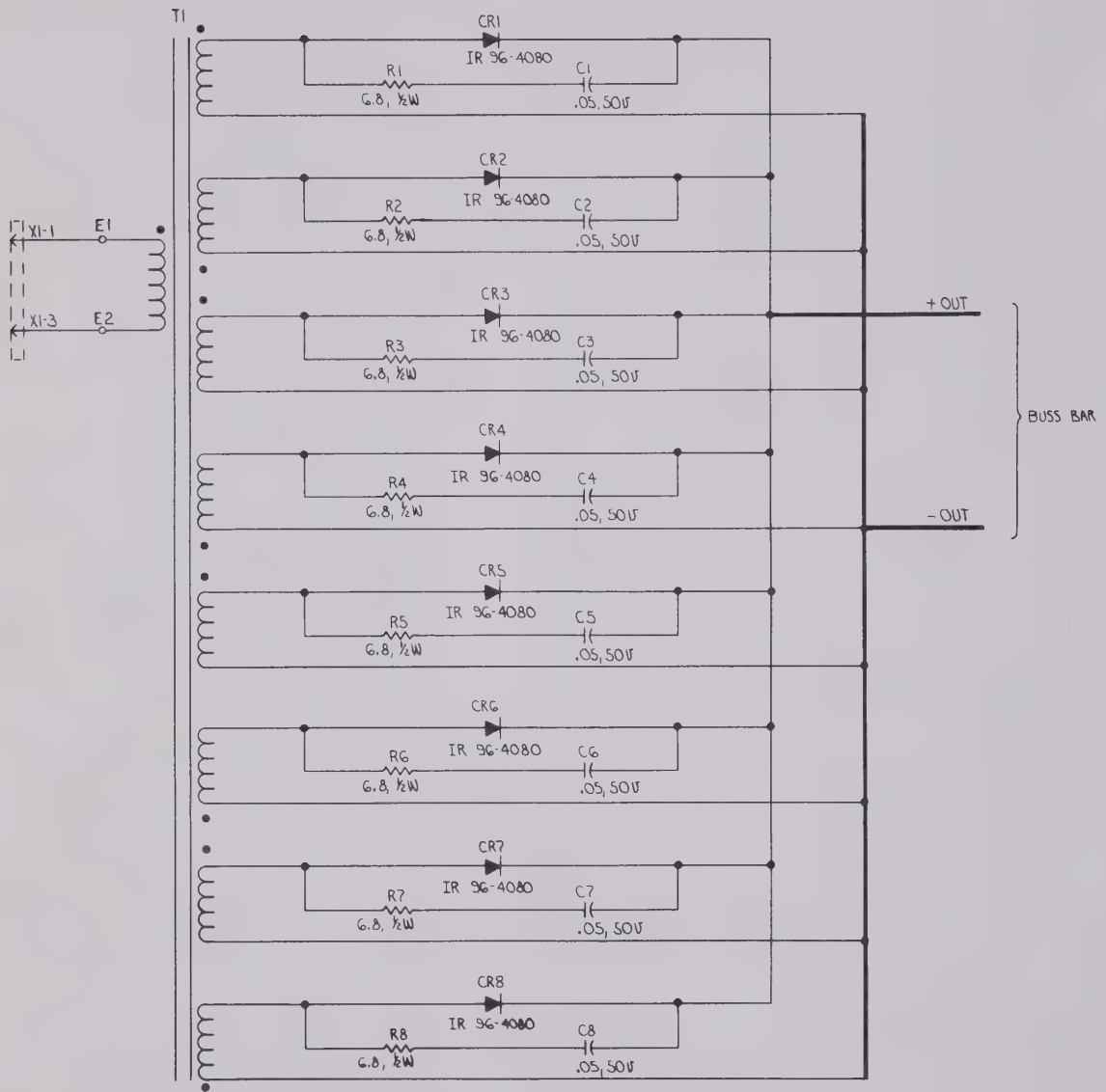
Figure 6-11 Output Rectifier Assembly

Table 6-10
Replaceable Parts List
Output Rectifier Assembly
1058134-1

<u>Location</u>	<u>Description</u>	<u>Part Number</u>	<u>Symbol</u>
	Diode, SD178	165196-2	CR1
	Diode, SD178	165196-2	CR2
	Diode, SD178	165196-2	CR3
	Diode, SD178	165196-2	CR4
	Diode, SD178	165196-2	CR5
	Diode, SD178	165196-2	CR6
	Diode, SD178	165196-2	CR7
	Diode, SD178	165196-2	CR8
	Res 6.8 Ω , 1/2W	585326-11	R1
	Res 6.8 Ω , 1/2W	585326-11	R2
	Res 6.8 Ω , 1/2W	585326-11	R3
	Res 6.8 Ω , 1/2W	585326-11	R4
	Res 6.8 Ω , 1/2W	585326-11	R5
	Res 6.8 Ω , 1/2W	585326-11	R6
	Res 6.8 Ω , 1/2W	585326-11	R7
	Res 6.8 Ω , 1/2W	585326-11	R8
	Thermostat	92-522	S1
	Power Xfmr	1058120-1	T1

Table 6-11
Parts Location List
Output Rectifier Assembly
1058134-1

<u>Location</u>	<u>Description</u>	<u>Part Number</u>	<u>Symbol</u>
1	Bus, Xfmr Sec.	1057780-5	A5
2	Output Rectifier PCB Assembly	1057816-1	
4	Heatsink, Power, Anodized	1057771-2	
5	Cable, Shutdown	1058185-1	
8	Clamp	362-7195P3	
10	PHMS, 6-32 X 5/16	6-2002-24	
11	PHMS, 2-56 X 1/4	6-2001-56	
12	Standoff, Hex	210-7194P16	
13	Washer, Lock, #6	6-4012-3	
14	Washer, Lock, #2	6-4012-1	
15	Standoff	1058195-1	
16	Jumper Kit	1058169-1	
18	Washer, Lock, #6	6-4010-3	
19	Washer, Flat, #6	6-4000-14	
20	Lug, Solder	4-137	
21	PHMS, 8-32 X 1/4	6-2002-38	

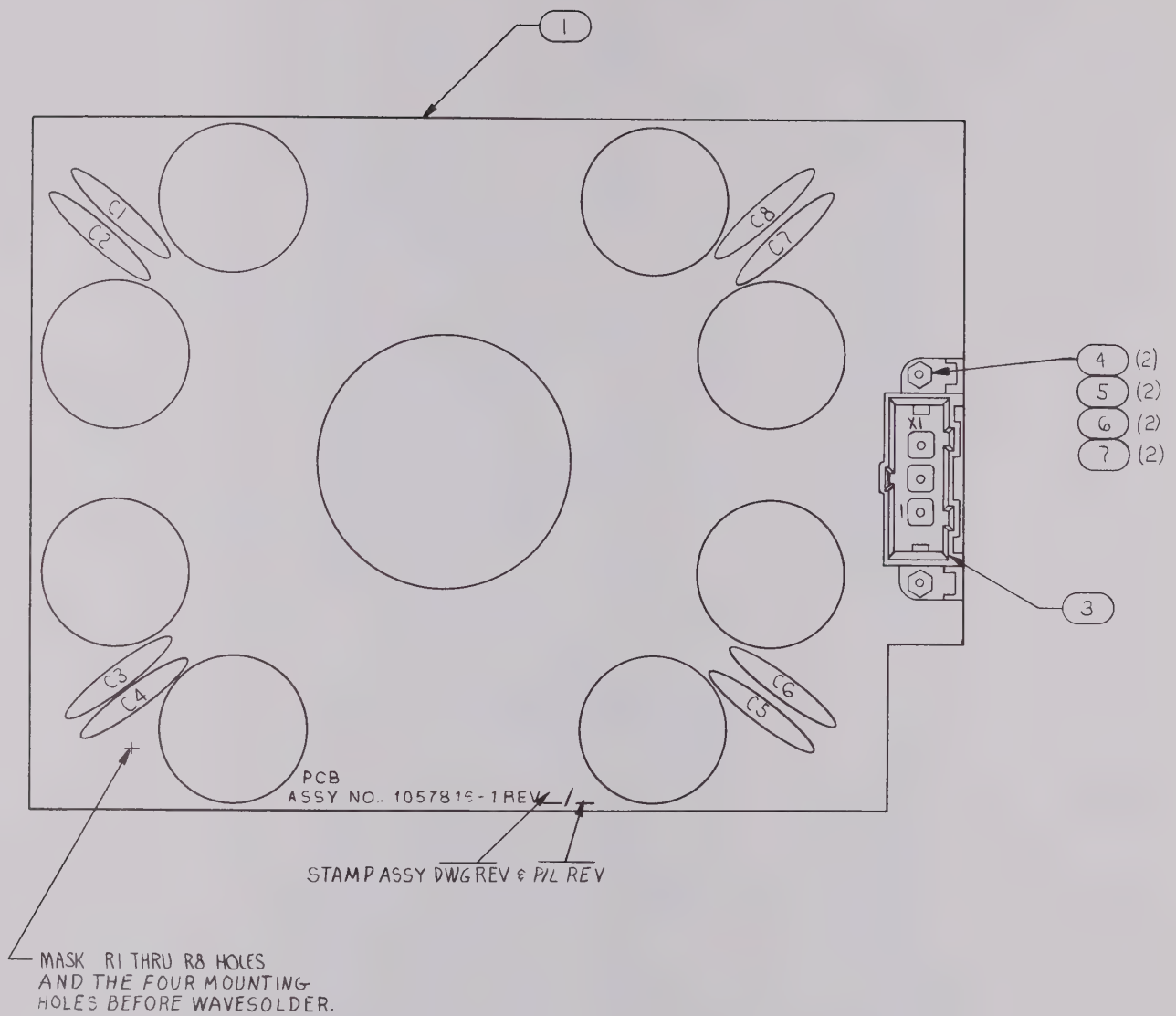


NOTES:

1. UNLESS OTHERWISE SPECIFIED
 - a. ALL RESISTORS ARE MEASURED IN OHMS
 - b. ALL CAPACITORS ARE MEASURED IN MICROFARADS.

D1057814 Rev A

Figure 6-12 Output Rectifier PCB Schematic (A5)

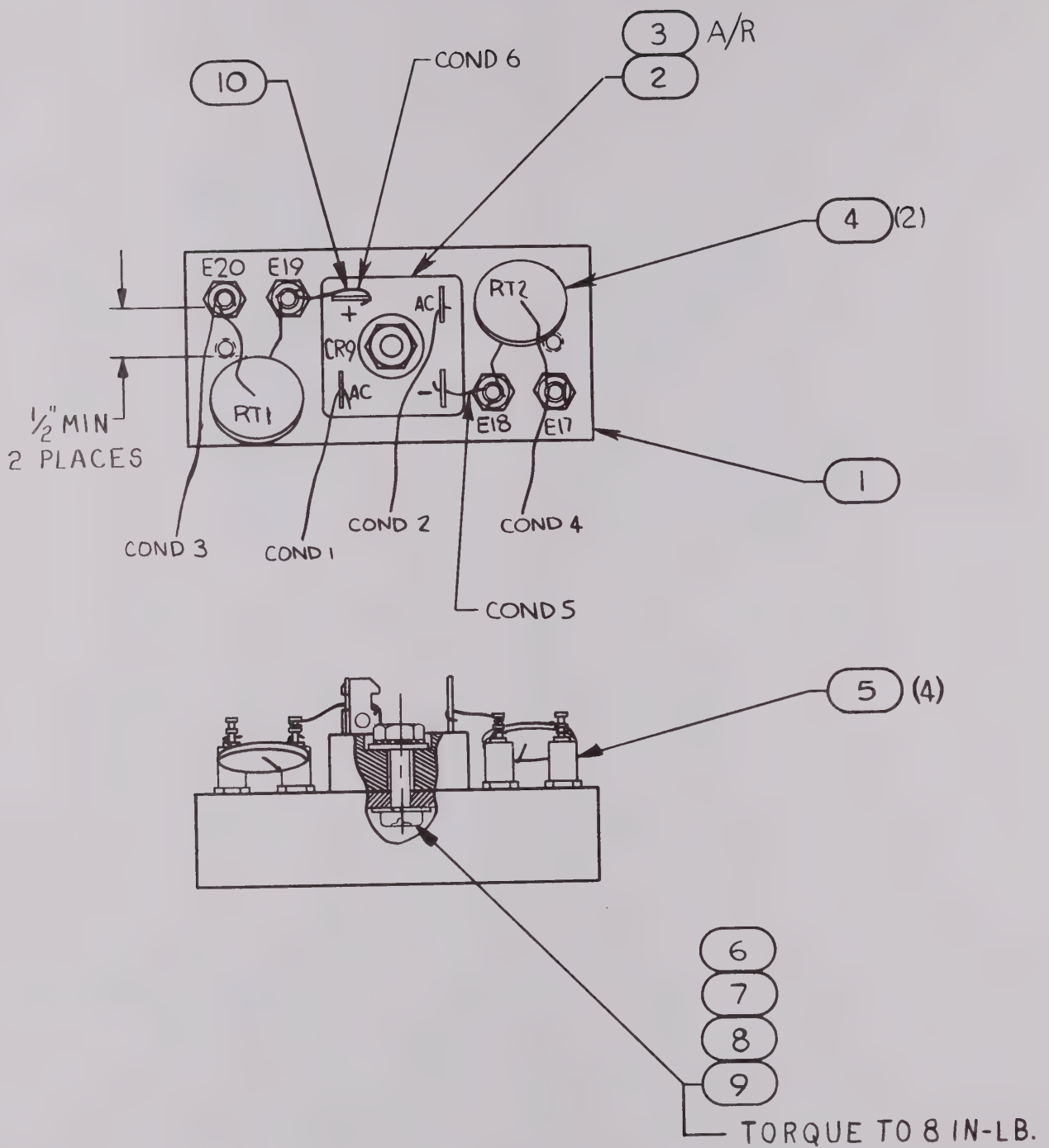


C1057816 Rev A

Figure 6-13 Output Rectifier PCB Assembly (A5)

Table 6-12
Replaceable Parts List
Output Rectifier PCB Assembly (A5)
1057816-1

<u>Location</u>	<u>Description</u>	<u>Part Number</u>	<u>Symbol</u>
	Cap, .05 μ F, 50V	235-7207P37	C1
	Cap, .05 μ F, 50V	235-7207P37	C2
	Cap, .05 μ F, 50V	235-7207P37	C3
	Cap, .05 μ F, 50V	235-7207P37	C4
	Cap, .05 μ F, 50V	235-7207P37	C5
	Cap, .05 μ F, 50V	235-7207P37	C6
	Cap, .05 μ F, 50V	235-7207P37	C7
	Cap, .05 μ F, 50V	235-7207P37	C8
	Conn Elec	1058160-1	X1
4	FHMS, 2-56 X 3/8	207-7196P9	
5	Washer, Lock #2	6-4012-1	
6	Washer, Flat, #2	6-4000-2	
7	Nut, Hex, 2-56, SS	6-3000-1	

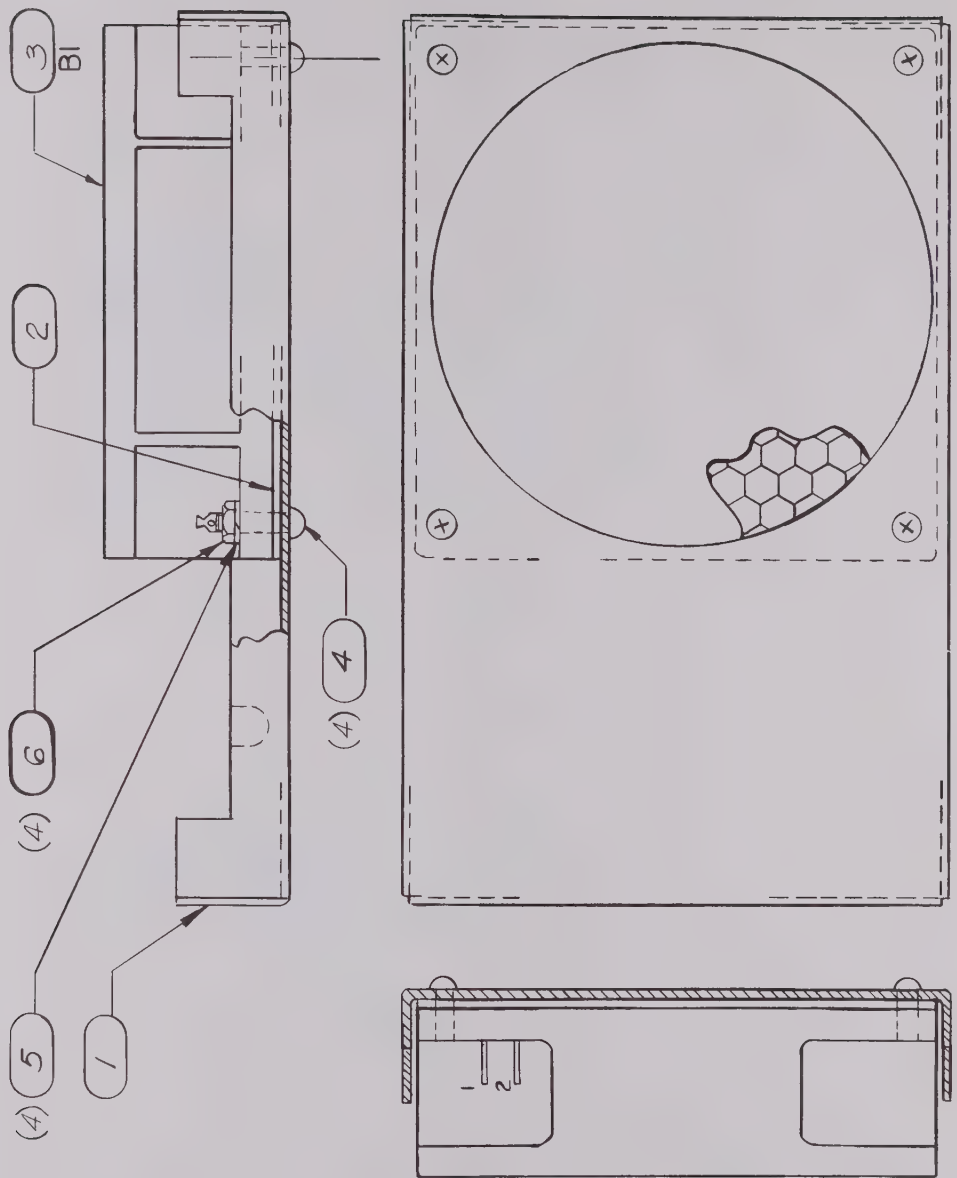


C1058135 Rev A

Figure 6-14 Input Rectifier Assembly

Table 6-13
Replaceable Parts List
Input Rectifier Assembly
1058135-1

<u>Location</u>	<u>Description</u>	<u>Part Number</u>	<u>Symbol</u>
	Bridge Rect, 35A	1058419-1	CR9
	Res, Th	980149-1	RT1
	Res, Th	980149-1	RT2
1	Heatsink, Rectifier, Anodized	1057772-2	
5	Terminal, Stud	227-1153P1	
6	PHMS, 8-32 X 7/8	6-2002-83	
7	Nut, 8-32 HIL, CS	2-361	
8	Washer, Flat, #8	6-4000-5	
9	Washer, Lock, #8	6-4012-4	
10	Jumper Kit	1058173-1	



AIR FLOW -1 & -2
 AIR FLOW -3 & -4

C1058132 Rev B

Figure 6-15 Rear Panel Assembly

Table 6-14
Replaceable Parts List
Rear Panel Assembly
1058132-2

<u>Location</u>	<u>Description</u>	<u>Part Number</u>	<u>Symbol</u>
1	Fan	91-1000-4	B1
2	Panel, Rear	1057832-1	
3	Grill	73-1421	B1
4	Fan	91-1000-4	
5	PHMS, 6-32 X 5/8	6-2001-15	
6	Washer, Lock, #6	6-4012-3	
	Nut, Hex, 6-32	6-3000-3	

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